

Index to

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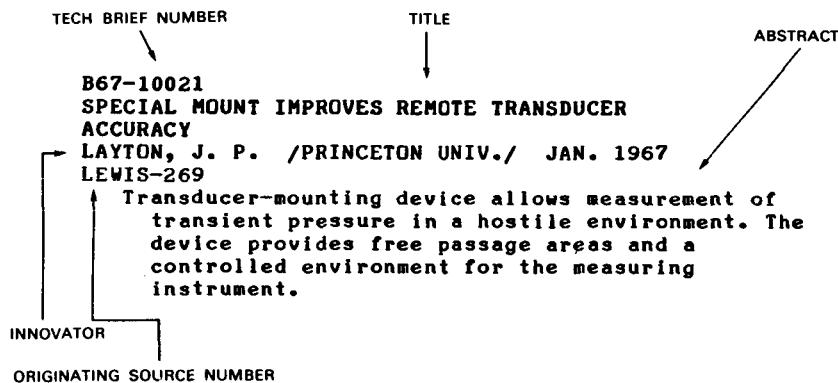
SPECIAL NOTICE

Beginning with this issue of *Index to NASA Tech Briefs* a new category, Category 06 (Computer Programs), appears. Tech Briefs dealing with computer programs were previously announced in Category 01, Electrical (Electronic). Tech Briefs accessioned early in 1967 dealing with computer programs will be found in Category 01; the more recent acquisitions on this subject will be in Category 06. In addition to these announcement categories, the headings in the Subject Index provide the reader with a more specific approach regarding his area of interest. Therefore, the reader interested in computer programs is also advised to scan the appropriate headings in the Subject Index (e.g. computer, computer program, data processing, digital computer).

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Introduction

This *Index to NASA Tech Briefs* lists the technological innovations published in this form during the period from January through June, 1967. The main section is arranged in six categories: Electrical (including Electronic); Physical Sciences (Energy Sources); Materials (including Chemistry); Life Sciences; Mechanical; and Computer Programs. A typical entry has these elements



To help users locate information of value, three indexes are provided. The first is a subject index, arranged alphabetically:



Note that in this index several routes are opened for obtaining further information. If the title seems promising, the Tech Brief number and category may be used to locate the abstract, which will be found in the main section arranged sequentially by Tech Brief number

within each category. Further, the Tech Brief number can of course be used for obtaining a copy of the original Tech Brief.

The second index relates all items by the originating source and number to the Tech Brief number and category.

The third index relates all items by the Tech Brief number and category to the originating source and number.

Copies of all Tech Briefs cited in this Index are available on subscription or in single copy as follows:

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This *Index* supplements the *Cumulative Index to NASA Tech Briefs* (NASA SP-5021(04)) which was published in February 1967.

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01 ELECTRICAL (ELECTRONIC)

B67-10001

PROGRAM COMPUTES SINGLE-POINT FAILURES IN CRITICAL SYSTEM DESIGNS
BROWN, W. R. /N. AM. AVIATION/ JAN. 1967
MSC-603

Computer program analyzes the designs of critical systems that will either prove the design is free of single-point failures or detect each member of the population of single-point failures inherent in a system design. This program should find application in the checkout of redundant circuits and digital systems.

B67-10002

COMPUTER PROGRAM DETECTS TRANSIENT MALFUNCTIONS IN SWITCHING CIRCUITS
CALVIN, E. L. /N. AM. AVIATION/ JAN. 1967
MSC-604

A program which accepts a system model in the form of Boolean equations and solves these equations using a ternary algebra will determine the response of large combinational and sequential switching circuits to given input changes, taking into account malfunctions due to races, hazards, and oscillations.

B67-10009

TESTER FOR STUDY OF ROLLING ELEMENT BEARINGS
ZARETSKY, E. V. FEB. 1967
LEWIS-305

Five-ball fatigue tester makes possible the study of rolling element phenomena. The device consists of a driven test ball pyramided upon four lower balls positioned by a separator and free to rotate in an angular contact raceway.

B67-10013

SELF-STARTING PROCEDURE SIMPLIFIES NUMERICAL INTEGRATION
JAN. 1967 SEE ALSO NASA-TN-D-2936
ARC-50

A self-starting, multistep procedure for the numerical integration of ordinary differential equations is devised to produce all the required backward differences directly from the initial equations. The self-starting element eliminates nonessential tallying to determine starting values.

B67-10015

ALUMINIZED THIN-WINDOW PROPORTIONAL-COUNTER TUBE IS STRONGER, MORE RESPONSIVE IN LONG WAVELENGTH REGION
SCHNOPPER, H. W. SHIELDS, R. A. /CORNELL UNIV./ JAN. 1967
JPL-689

A thin-window proportional counter tube of 0.25-mil Mylar with a thin aluminum coating on one side permits efficient detection of long wavelength X-rays. It is sufficiently rugged for long-term use in space or other demanding environments.

B67-10017

SHORTENED HORN-REFLECTOR ANTENNA
LANTZ, P. A. JAN. 1967
GSFC-502

A shortened horn-reflector antenna overcomes the mechanical disadvantages and complexity of the conventional horn-reflector antenna. The shortened antenna offers broadband performance, economic construction, very low antenna temperature, and excellent pattern performance.

B67-10020

MINIATURE CAPACITOR FUNCTIONS AS PRESSURE SENSOR
HARRISON, R. G. FEB. 1967
JPL-903

Miniature capacitor operates as a differential-pressure telemetry sensor during free flight of test model in a hypersonic wind tunnel. The capacitor incorporates a beryllium copper

diaphragm. It is also used as an absolute pressure sensor.

B67-10022

VARIABLE-PULSE SWITCHING CIRCUIT ACCURATELY CONTROLS SOLENOID-VALVE ACTUATIONS
GILLETT, J. D. /N. AM. AVIATION/ FEB. 1967
M-FS-1895

Solid state circuit generating adjustable square wave pulses of sufficient power operates a 28 volt dc solenoid valve at precise time intervals. This circuit is used for precise time control of fluid flow in combustion experiments.

B67-10025

COMPUTER/PERT TECHNIQUE MONITORS ACTUAL VERSUS ALLOCATED COSTS
HOURY, E. WALKER, J. D. FEB. 1967
LEWIS-260

A computer method measures the user's performance in cost-type contracts utilizing the existing NASA program evaluation review technique without imposing any additional reporting requirements. Progress is measured by comparing actual costs with a value of work performed in a specific period.

B67-10027

FEED-THROUGH CONNECTOR COUPLES RF POWER INTO VACUUM CHAMBER
GRANDY, G. L. /WESTINGHOUSE ASTRONUCL. LAB./ FEB. 1967
NU-0096

Feed-through device connects RF power to an RF coil in a vacuum chamber. The coil and leads are water cooled and vacuum tight seals are provided at the junctions. The device incorporates silver soldered copper tubes, polytetrafluoroethylene electrical insulators, and O-ring vacuum seals.

B67-10028

MONITOR ASSURES AVAILABILITY AND QUALITY OF COMMUNICATION CHANNELS
SMITH, G. P. /RCA/ FEB. 1967
KSC-66-38

System monitors a communication channel for proper circuit parameters and energizes an alarm if these parameters do not fall within allowable limits. It comprises a monitor-signal transmitter at the transmitting end of the channel and a monitor-signal receiver at the receiving end.

B67-10029

INSTRUMENT SEQUENTIALLY SAMPLES AC SIGNALS FROM SEVERAL ACCELEROMETERS
CHAPMAN, C. P. FEB. 1967 SEE ALSO B66-10462
JPL-884

Scanner circuit sequentially samples the ac signals from accelerometers used in conducting noise vibration tests, and provides a time-averaged output signal. The scanner is used in conjunction with other devices for random noise vibration tests.

B67-10030

LOCAL MEASUREMENTS IN TURBULENT FLOWS THROUGH CROSS CORRELATION OF OPTICAL SIGNALS
FISHER, M. J. FEB. 1967
M-FS-1268

Crossed beam correlation method measures turbulent fluctuations in transonic and supersonic flows. Two collimated beams of radiation are crossed at the point of interest in the flow, and the power loss of each beam is measured with two independent photodetectors, which yield information about the turbulent properties.

B67-10031

HIGH TRANSIENTS SUPPRESSED IN ELECTROMAGNETIC DEVICES
MARION, C. W. FEB. 1967
KSC-66-13

A bifilar winding around the magnetic core of electromagnetic devices suppresses high transient voltages. The winding is alternately spaced vertically and radially from the core to achieve a high coefficient of coupling.

B67-10035

THERMOELECTRIC METAL COMPARATOR DETERMINES COMPOSITION OF ALLOYS AND METALS
STONE, C. C. WALKER, D. E. FEB. 1967
ARG-235

EMF comparing device nondestructively inspects metals and alloys for conformance to a chemical specification. It uses the Seebeck effect to measure the difference in EMF produced by the junction of a hot probe and the junction of a cold contact on the surface of an unknown metal.

B67-10038

RESIDUAL MAGNETISM HOLDS SOLENOID ARMATURE IN DESIRED POSITION
CRAWFORD, R. P. /GEN. DYN./ MAR. 1967
LEWIS-343

Holding solenoid uses residual magnetism to hold its armature in a desired position after excitation current is removed from the coil. Although no electrical power or mechanical devices are used, the solenoid has a low tolerance to armature displacement from the equilibrium position.

B67-10040

STUDY MADE OF EXPLOSIVE CUTTING IN SIMULATED SPACE ENVIRONMENTS
COLEMAN, E. R. HAMILTON, L. O. /HAYES INTERN. CORP./ MAR. 1967 SEE ALSO NASA-TM-X-53440
M-FS-1597

Study indicates the feasibility of explosive cutting and establishes techniques applicable to in-space cutting operations. Results show no degradation of the explosive and that work hardening of the target material is limited to the cut edge.

B67-10041

ABSOLUTE VISCOSITY MEASURED USING INSTRUMENTED PARALLEL PLATE SYSTEM
BROYLES, H. H. MAR. 1967
JPL-874

An automatic system measures the true average shear viscosity of liquids and viscoelastic materials, using the parallel plate method and automatically displays the results on a graphic record. This eliminates apparatus setup and extensive calculations.

B67-10042

IMPROVED FLUID CONTROL CIRCUIT OPERATES ON LOW POWER INPUT
GEBBEN, V. MAR. 1967
LEWIS-325

Standard electromagnetic relay actuates fluid control circuits with low level electrical signals by switching a fluid amplifier that drives a spool valve.

B67-10046

MULTIPURPOSE INSTRUMENTATION CABLE PROVIDES INTEGRAL THERMOCOUPLE CIRCUIT
ZELLNER, G. /WESTINGHOUSE ASTRONUCL. LAB./ MAR. 1967
NU-0108

Multipurpose cable with an integral thermocouple circuit measures strain, vibration, pressure, throughout a wide temperature range. This cable reduces bulky and complex circuitry by eliminating separate thermocouples for each transducer.

B67-10053

SOLID-STATE TIME-TO-PULSE-HEIGHT CONVERTER DEVELOPED
LYNCH, R. J. RODDICK, R. G. MAR. 1967
ARG-170

Solid-state circuit produces an output pulse with an amplitude directly proportional to the time interval between two input pulses. It uses selected circuit options to achieve variable mode operation and a tunnel diode controls the charging time of a capacitor in proportion to the time interval being measured.

B67-10055

CIRCUIT MULTIPLIES PULSE WIDTH MODULATION, EXHIBITS LINEAR TRANSFER FUNCTION
CARLSON, A. W. FURCINITI, A. MAR. 1967

HQ-56

Modulation multiplier provides a simple means of multiplying the width modulation of a pulse train by a constant factor. It operates directly on a pulse width modulated input signal to generate an output pulse train having a greater degree of width modulation than the input signal.

B67-10060

ELECTRON MULTIPLIER HAS IMPROVED PERFORMANCE AND STABILITY
INNOVATOR NOT GIVEN /G.C.A. CORP./ MAR. 1967
GSFC-546

Electron multiplier contains a series of massive metal dynodes, compactly secured with ceramic rods for operation in a metal housing. The housing is rigidly mounted within a soft steel vacuum enclosure which shields the multiplier from the effects of external electromagnetic fields.

B67-10061

CONTROL CIRCUIT ENSURES SOLAR CELL OPERATION AT MAXIMUM POWER
PAULKOVICH, J. MAR. 1967
GSFC-432

Control circuit enables a solar cell power supply to deliver maximum electrical power to a load. It senses the magnitude of the slope of the voltage-current characteristic curve and compares it to a reference voltage which represents the slope corresponding to the desired operating limits.

B67-10065

PORTABLE DETECTOR SET DISCLOSES HELIUM LEAK RATES
ANDERSON, G. E. /N. AM. AVIATION/ APR. 1967
M-FS-1733

Portable helium detector measuring helium leak rates makes possible the use of the inert gas helium as a tracer. This helps solve safety and contamination problems in detecting leaks in closed fluid systems.

B67-10074

FLOW-TEST DEVICE FITS INTO RESTRICTED ACCESS PASSAGES
FITZGERALD, J. J. OBERSCHMIDT, M. ROSENBAUM, B. J. APR. 1967
MSC-1078

Test device using a mandrel with a collapsible linkage assembly enables a fluid flow sensor to be properly positioned in a restricted passage by external manipulation. This device is applicable to the combustion chamber of a rocket motor.

B67-10076

CLEANROOM AIR SAMPLER COUNTS, CATEGORIZES, AND RECORDS PARTICLE DATA
NELSON, M. B. /IIT RES. INST./ JUN. 1967
M-FS-2221

Light scattering particle counter monitors particles in a clean room. It categorizes and records the particles according to size and functions simultaneously in three separate areas. The counter uses a transducer head to transform light signals into electric signals.

B67-10077

COMPUTER PROGRAM SIMULATES DESIGN, TEST, AND ANALYSIS PHASES OF SENSITIVITY EXPERIMENTS
ALEXANDER, M. J. ROTHMAN, D. ZIMMERMAN, J. M. /N. AM. AVIATION/ APR. 1967
M-FS-1496

Modular program with a small main program and several specialized subroutines provides a general purpose computer program to simulate the design, test and analysis phases of sensitivity experiments. This program allows a wide range of design-response function combinations and the addition, deletion, or modification of subroutines.

B67-10080

INSTRUMENT CONTINUOUSLY MEASURES DENSITY OF FLOWING FLUIDS
JACOBS, R. B. MACINKO, J. MILLER, C. E. /NBS/ APR. 1967

LEWIS-309

Electromechanical densitometer continuously measures the densities of either single- or two-phase flowing cryogenic fluids. Measurement is made on actual flow. The instrument operates on the principle that the mass of any vibrating system is a primary factor in determining the dynamic characteristics of the system.

B67-10084

CIRCUIT INCREASES CAPABILITY OF HYSTERESIS SYNCHRONOUS MOTOR
MARKOWITZ, I. N. /RCA/ APR. 1967
MSC-1080

Frequency and phase detector circuit enables a hysteresis synchronous motor to drive a load of given torque value at a precise speed determined by a stable reference. This technique permits driving larger torque loads with smaller motors and lower power drain.

B67-10085

TRIPLE MODULAR REDUNDANCY /TMR/ COMPUTER OPERATION IMPROVED
BALL, M. HARDIE, F. H. /IBM/ APR. 1967
MSC-831

Switching off a failed element plus one of the good elements in the TMR computer operation keeps the reliability curve from crossing the simplex curve. This method increases reliability and prevents system failure.

B67-10086

AUTOMATIC CHANNEL SWITCHING DEVICE
BALL, M. OLNOWICH, H. T. /IBM/ APR. 1967
MSC-832 MSC-834

Automatic channel switching device operates with all three triple modular redundant channels when there are no errors. When a failure occurs, channel and module switching isolate the failure to a specific channel. Since only one must operate correctly, reliability is increased.

B67-10087

TRANSLATOR PROGRAM CONVERTS COMPUTER PRINTOUT INTO BRAILLE LANGUAGE
POWELL, R. A. /BOEING CO./ APR. 1967
M-FS-2061

Computer program converts print image tape files into six dot Braille cells, enabling a blind computer programmer to monitor and evaluate data generated by his own programs. The Braille output is printed 8 lines per inch.

B67-10090

SYSTEM AUTOMATICALLY SUPPLIES PRECISE ANALYTICAL SAMPLES OF HIGH-PRESSURE GASES
LANGDON, W. M. /IIT RES. INST./ APR. 1967
M-FS-1814

High-pressure-reducing and flow-stabilization system delivers analytical gas samples from a gas supply. The system employs parallel capillary restrictors for pressure reduction and downstream throttling valves for flow control. It is used in conjunction with a sampling valve and minimizes alterations of the sampled gas.

B67-10091

SYSTEM MAINTAINS CONSTANT PENETRATION DURING FUSION WELDING
COOK, G. /HERRIK ENG./ MC CAMPBELL, W. M. APR. 1967
M-FS-937

Servo system senses variations in fusion welding process, and adjusts the control parameters to compensate for them. The system assumes a correlation between uniform weld penetration and temperature gradients near the molten puddle. It senses weld properties and makes adjustments to travel speed and weld current.

B67-10092

GREMEX-A NEW MANAGEMENT TRAINING CONCEPT
DENAULT, M. F. VACCARO, M. J. APR. 1967
GSFC-574

Goddard Research Engineering Management Exercise provides experience in R&D project decision making from a management rather than technological view. The participant directs a

hypothetical project presented in the management simulation technique. He uses old or new methods without concern for rewards or penalties existing in real life.

B67-10093

STRAIN GAGE CIRCUITRY PROVIDES FATIGUE TESTING MACHINE WITH ACCURATE CYCLE COUNT
PARK, R. /WESTINGHOUSE ASTRONUCL. LAB./ APR. 1967
NU-0114

Fatigue tester determines the number of cycles to fatigue failure of brittle specimens. A strain gage on the loading arm records the loading applied to the component. As the component starts to break, the load is reduced and the strain gage stops the cycle counter.

B67-10097

HEATER CONTROL CIRCUIT PROVIDES BOTH FAST AND PROPORTIONAL CONTROL
BASLOCK, R. W. /IBM/ APR. 1967
M-FS-906

Proportional control circuit supplies a heater with full current, from a pulsating dc source, to a present temperature and then switches to proportional control for fine temperature regulation. Two resistors and a diode are added to the existing circuit. The circuit can be adapted to control other functions.

B67-10099

SYSTEM ENABLES MORE COMPLETE CALIBRATIONS OF DYNAMIC-PRESSURE TRANSDUCERS
PERNET, D. F. /IIT RES. INST./ APR. 1967
M-FS-2063

Absolute pressure calibration system using a Michelson interferometer calibrates phase characteristics and pressure sensitivities of the transducers that monitor acoustic or aerodynamic pressure fields. The interferometer uses a helium-neon laser light source and interchangeable acoustic signal generators to produce acoustic waves.

B67-10101

DOUBLE EMITTER SUPPRESSED CARRIER MODULATOR USES COMMERCIALY AVAILABLE COMPONENTS
HAIST, C. F. PISCOPO, A. /IBM/ APR. 1967
M-FS-2494

Double emitter suppressed carrier modulator develops a signal-to-carrier minimum output ratio of 40 db and signal input of 2.5 volts. The circuit uses a commercially available double emitter chopper transistor. It eliminates tuning potentiometers and reduces sideband harmonics.

B67-10103

POLYNOMIAL MANIPULATOR AP-168
TUTT, G. E. /N. AM. AVIATION/ MAY 1967
MSC-1231

Linear Systems Design Evaluation Program, AP-168 combines the many different analysis techniques used to evaluate and manipulate polynomials. The single program is a pseudo instruction abstraction. It allows the user to enter polynomials of the Laplace operators and to manipulate them freely.

B67-10104

PARAMETRIC UP-CONVERTER INCREASES FLEXIBILITY OF MASER
SUMMY, R. H. APR. 1967
KSC-67-98

Parametric up-converter translates a broad band of signals to the fixed tuned input frequency of a maser. This modified maser can operate in the 1700-2300 Mc range, eliminating the need to duplicate equipment. It may be applied in communications and radio astronomy.

B67-10106

RF INDUCTOR HAS HIGH Q, IS STABLE AT HIGHER TEMPERATURES
WILER, E. M. MAY 1967
JPL-1019

Encapsulated RF inductor with an insulated coil has a high Q and remains stable for long periods of time at high temperatures. The coil is wound

01 ELECTRICAL (ELECTRONIC)

on a core and both are encapsulated in an epoxy resin. Two terminals are soldered to the coil.

B67-10108
COMPUTER PROGRAM REDUCES CALCULATION TIME
OF NORMAL RESPONSE FUNCTIONS
ALEXANDER, M. J. ROTHMAN, D. ZIMMERMAN, J. M.
/N. AM. AVIATION/ MAY 1967
M-FS-1517

Fortran II computer program rapidly calculates parameters of maximum likelihood estimates from sensitivity experiment data populations. The program uses the Newton-Raphson iterative procedure to calculate the mean and standard deviation of portions of the cumulative normal response function.

B67-10111
FIXTURE TESTS BELLINGS RELIABILITY THROUGH
REPETITIVE PRESSURE/TEMPERATURE CYCLING
LEVINSON, C. /SPERRY GYROSCOPE CO./ MAY 1967
MSC-1176

Fixture explores the reliability of bellows used in precision in inertial systems. The fixture establishes the ability of the bellows to withstand repetitive over-stress pressure cycling at elevated temperatures. It is applicable in quality control and reliability programs.

B67-10115
LIQUID HYDROGEN DENSITOMETER UTILIZES
OPEN-ENDED MICROWAVE CAVITY
SMETANA, J. WENGER, N. C. APR. 1967 SEE ALSO
NASA-TN-D-3680
LEWIS-390

Open-ended microwave cavity directly measures the density of flowing liquid, gaseous, or two-phase hydrogen. Its operation is based on derived relations between the cavity resonant frequency and the dielectric constant and density of hydrogen.

B67-10116
DETECTION OF ENTRAPPED MOISTURE IN
HONEYCOMB SANDWICH STRUCTURES
HALLMARK, W. B. /N. AM. AVIATION/ MAY 1967
MSC-1103

Thermal neutron moisture detection system detects entrapped moisture in intercellular areas of bonded honeycomb sandwich structures. A radium/beryllium fast neutron source bombards a specimen. The emitted thermal neutrons from the target nucleus are detected and counted by a boron trifluoride thermal neutron detector.

B67-10118
TV SYNCHRONIZATION SYSTEM FEATURES
STABILITY AND NOISE IMMUNITY
LANDAUER, F. P. MAY 1967
JPL-915

Horizontal jitter in the video presentation in television systems is prevented by using an additional sync level. This circuitry uses simultaneous signals at both sync and porch frequencies, providing a sync identification from which a coincidence circuit can generate pulses having the required stability and noise immunity.

B67-10119
PERSONAL COMMUNICATION SYSTEM COMBINES HIGH
PERFORMANCE WITH MINIATURIZATION
ATLAS, N. D. /N. AM. AVIATION/ MAY 1967
MSC-720 MSC-722

Personal communication system provides miniaturized components that incorporate high level signal characteristics plus noise rejection in both microphone and earphone circuitry. The microphone is designed to overcome such spacecraft flight problems as size, ambient noise level, and RF interference.

B67-10125
EDGE-TYPE CONNECTORS EVALUATED BY
ELECTRICAL NOISE MEASUREMENT
BRUMMETT, S. L. /BOEING CO./ MAY 1967
M-FS-2243

Electrical noise measurement system measures noise generated by edge-type connectors and circuit cards when they are subjected to sinusoidal

vibration. It provides a signal across the contact area and monitors the signal change during vibration. Noise measured can be expressed as a varying change in total contact resistance.

B67-10127
CALIBRATING ULTRASONIC TEST EQUIPMENT FOR
CHECKING THIN METAL STRIP STOCK
PETERSON, R. M. /AEROJET-GEN. CORP./ JUN. 1967
NUC-10009

Calibration technique detects minute laminar-type discontinuities in thin metal strip stock. Patterns of plastic tape are preselected to include minutely calculated discontinuities and the tape is applied to the strip stock to intercept the incident sonic beam.

B67-10130
MODIFIED UNIVIBRATOR COMPENSATES FOR OUTPUT
TIMING ERRORS
STRAUSS, M. G. MAY 1967
ARC-85

One-stage, delay compensation amplifier, added to conventional univibrator circuitry time-synchronizes the trailing edge of the output pulse with the origin of the input pulse. The trailing edge is independent of the amplitude of the input pulse.

B67-10135
INTEGRATOR CAN EASILY BE SET AND RESET WITH
AN ELECTRONIC SWITCH
DEBOO, G. J. MAY 1967
ARC-10002

Electronic switch sets and resets integrator circuit to some initial condition using a grounded capacitor. This circuit also uses four equal resistors and an operational amplifier.

B67-10136
COMPUTER PROGRAM CALCULATES MONOTONIC
MAXIMUM LIKELIHOOD ESTIMATES USING METHOD
OF REVERSALS
ALEXANDER, M. J. /N. AM. AVIATION/ MAY 1967
M-FS-1516

Fortran II computer program calculates maximum estimates of a monotonic non-decreasing response function. The program uses the method of reversals algorithm which applies to the analysis of univariate or multivariate sensitivity experiments.

B67-10137
VARIABLE RELUCTANCE SWITCH AVOIDS CONTACT
CORROSION AND CONTACT BOUNCE
WATSON, P. C. /MIT/ MAY 1967
MSC-1178

Variable reluctance switch avoids contact corrosion and bounce in a hostile environment. It consists of a wire-wound magnetic core and moveable bridge piece that alters the core flux pattern to produce an electrical output useful for switching control media.

B67-10139
RECORDING AND TIME EXPANSION TECHNIQUE FOR
HIGH-SPEED, SINGLE-SHOT TRANSIENT VIDEO
SIGNAL
HRUBY, R. J. SANDER, R. C. MAY 1967
ARC-10003

High-speed, single shot, transient voltage is recorded on a video tape recorder, which, when played back, converts the single signal to a repetitive signal. This drives a sample data translator which lengthens the original transient production time, suiting it to an x-y plotter or computer tape recorder use.

B67-10140
CLAMP PROVIDES EFFICIENT CONNECTION FOR
HIGH-DENSITY CURRENTS
MC CARTHY, J. R. TREBES, D. M. /N. AM. AVIATION/
MAY 1967
M-FS-2417

Electrical connector clamp /bus bar/ gives high contact-surface efficiency for providing a high current to thin wall stainless steel tubing containing hydrogen gas. It uses lead solder film to provide the electrical equivalent of a

fusion bond without degrading the grain structure, permitting disassembly and reuse of the components.

B67-10142

THIN FILM PROCESS FORMS EFFECTIVE ELECTRICAL CONTACTS ON SEMICONDUCTOR CRYSTALS
FORMIGONI, N. P. ROBERTS, J. S. /WESTINGHOUSE ELEC. CORP./ MAY 1967
M-FS-2343

Process makes microscopic, low-resistance electrical contacts on hexagonal n-type silicon carbide crystals used for microelectronic devices. A vacuum deposition of aluminum is etched to expose the bare silicon carbide where the electrical contacts are made. Sputtering alternating layers of tantalum and gold forms the alloy film.

B67-10143

DESIGN CONCEPTS USING RING LASERS FOR FREQUENCY STABILIZATION
MOCKER, H. /HONEYWELL INC./ MAY 1967
M-FS-2448

Laser frequency stabilization methods are based on a frequency discriminant which generates an unambiguous deviation signal used for automatic stabilization. Closed-loop control stabilizes cavity length at a null point. Some systems have a stabilized ring laser using a piezoelectric dither and others use a Doppler gain tube.

B67-10144

PROCESS FACILITATES PHOTORESIST MASK ALIGNMENT ON SIC CRYSTALS
FORMIGONI, N. P. ROBERTS, J. S. /WESTINGHOUSE ELEC. CORP./ MAY 1967
M-FS-2394

Growth of silicon dioxide on a silicon carbide crystal ensures proper orientation of photoresist masks on the crystals used for semiconductor devices. The crystal is heated in a water vapor-saturated gas to delineate p-n junctions that intersect the crystal surface.

B67-10145

TEST INSTRUMENTATION EVALUATES ELECTROSTATIC HAZARDS IN FLUID SYSTEM
COLLINS, L. H. HENRY, R. KREBS, D. /BOEING CO./ MAY 1967
M-FS-2277

RJ-1 fuel surface potential is measured with a probe to determine the degree of hazard originating from static electricity buildup in the hydraulic fluid. The probe is mounted in contact with the fluid surface and connected to an electrostatic voltmeter.

B67-10146

HYDROGEN MASER AS A HIGHLY STABLE FREQUENCY REFERENCE
VANIER, J. VESSOT, R. /VARIAN ASSOC./ MAY 1967
M-FS-2437

Hydrogen maser is stable short- and long-term frequency reference for precision tracking systems. Its resettability is expressed as the rms deviation from the mean.

B67-10150

MULTIPLEXING CONTROL DEVICE ENABLES HANDLING OF WIDE VARIATIONS IN SAMPLING RATES
INNOVATOR NOT GIVEN. /WESTINGHOUSE ELEC. CORP./ JUN. 1967
M-FS-1871

ESS telecommunication system concept provides the ability to change according to needs indicated by the data without any change to the lunar experiment equipment. The system will include a magnetic core memory as the data multiplexing control device.

B67-10151

ELECTRONIC FREQUENCY DISCRIMINATOR
REID, W. J. /MOTOROLA, INC./ JUN. 1967
M-FS-2434

Digital comparator permits discrimination at accuracy of reference frequency. The compare circuit is a shift register element.

B67-10152

MEANS FOR IMPROVING APPARENT RESOLUTION OF TELEVISION
HILBORN, E. H. MAY 1967
ERC-65

Technique using short term temporal integration characteristics of the observer's visual system improves the apparent resolution of television video presentations. The raster is displaced slightly on each frame so the eye can integrate the information in each raster grain. This phase shift uses a switching time delay.

B67-10153

STUDY OF YTTRIUM IRON GARNET RODS REVEALS NEW MAGNETOSTATIC ECHO MODE
KEDZIE, R. W. /SPERRY RAND RES. CENTER/ JUN. 1967
ERC-37

Echo mode in YIG rods has different behavior in magnetic fields. This mode, discovered at 8.5 gigahertz, experiences a linear variation. The time delay exhibited is a linear function of the applied magnetic field and the input pulse frequency.

B67-10155

SUBMINIATURE DEFLECTION CIRCUIT OPERATES INTEGRATED SWEEP CIRCUITS IN TV CAMERA
SCHAFF, F. L. /WESTINGHOUSE ELEC. CORP./ MAY 1967
MSC-1263

Small magnetic sweep deflection circuits operate a hand-held lunar television camera. They convert timing signals from the synchronizer into waveforms that provide a raster on the vidicon target. Raster size remains constant and linear during wide voltage and temperature fluctuations.

B67-10156

VOLTAGE REGULATOR/AMPLIFIER IS SELF-REGULATED
DAY, W. E. PHILLIPS, D. E. /COLLINS RADIO CO./ MAY 1967
MSC-1240

Signal modulated, self-regulating voltage regulator/amplifier controls the output b+ voltage in modulated regulator systems. It uses self-oscillation with feedback to a control circuit with a discontinuous amplitude action feedback loop.

B67-10157

DESIGN CONCEPT FOR IMPROVED PHOTO-SCAN TUBE
MALLING, L. R. JUN. 1967
JPL-818

Conceptual photo-scan tube avoids complexity of internal beam scanning and beam-current adjustment by optical scan readout. It differs from a conventional image orthicon in its use of an external oscilloscope tube.

B67-10160

A POWER-SPECTRAL-DENSITY COMPUTER PROGRAM
CHAPMAN, C. P. JUN. 1967
NPO-10126

Computer program simplifies and clarifies random-noise vibration test results. It also varies PSD test specifications, sets up automatic equalization equipment, and calculates an exact acceleration level for the random noise prior to the test.

B67-10161

SENSING DISKS FOR SLUG-TYPE CALORIMETERS HAVE HIGHER TEMPERATURE STABILITY
INNOVATOR NOT GIVEN /SOUTHERN RES. INST./ JUN. 1967
M-FS-1867

Graphite sensing disk for slug-type radiation calorimeters exhibits better performance at high temperatures than copper and nickel disks. The graphite is heat-soaked to stabilize its emittance and the thermocouple is protected from the graphite so repeated temperature cycling does not change its sensitivity.

B67-10162

CLOSED CIRCUIT TV SYSTEM MONITORS WELDING OPERATIONS

GILMAN, M. /N. AM. AVIATION/ JUN. 1967
MSC-11002

TV camera system that has a special vidicon tube with a gradient density filter is used in remote monitoring of TIG welding of stainless steel. The welding operations involve complex assembly welding tools and skates in areas of limited accessibility.

B67-10165
HYBRID SOLID STATE SWITCH REPLACES MOTOR-DRIVEN POWER SWITCH
BOOTH, R. A. SCHLOSS, A. I. JUN. 1967
JPL-931

Hybrid solid state switch replaces existing motor-driven power switches used on spacecraft. It uses a transistor circuit to limit the open circuit voltage and allow small relay contacts to handle high transient currents at reasonable cycle life.

B67-10166
EFFICIENT MILLIMETER WAVE /140 GHZ/ DIODE FOR HARMONIC POWER GENERATION
INNOVATOR NOT GIVEN /ADVAN. TECHNOL. CORP./ JUN. 1967
HQ-61

Epitaxial gallium arsenide diode junction formed in a crossed waveguide structure operates as a variable reactance harmonic generator. This varactor diode can generate power efficiently in the low-millimeter wavelength.

B67-10170
DATA RETRIEVAL SYSTEM PROVIDES UNLIMITED HARDWARE DESIGN INFORMATION
RAWSON, R. D. SWANSON, R. L. /N. AM. AVIATION/ JUN. 1967
MSC-1144

Data is input to magnetic tape on a single format card that specifies the system, location, and component, the test point identification number, the operator's initial, the date, a data code, and the data itself. This method is efficient for large volume data storage and retrieval, and permits output variations without continuous program modifications.

B67-10171
STRUCTURAL ANALYSIS AND MATRIX INTERPRETIVE SYSTEM /SAMIS/
INNOVATOR NOT GIVEN /PHILCO CORP./ JUN. 1967
NPO-10130

Structural Analysis and Matrix Interpretive System eliminates high-speed digital computer restrictions of lack of generalization and lack of flexibility. Programming concepts of the system are standardization, modularity, and programming for intermediate-size problems.

B67-10175
NUMERICAL DATA FRAME READOUT SYSTEM USED IN TESTING TELEMETRY SYSTEMS
COTE, C. E. CRESSEY, J. R. JUN. 1967
GSFC-551

Digital telemetry systems are tested by a display system that offers direct leadout as high data rates. The rates appear in numerical format and are adaptable to photographic recording techniques. The system can show bit dropouts at a memory output or locate a malfunction in a system.

B67-10176
THERMAL AND BIAS CYCLING STABILIZES PLANAR SILICON DEVICES
HARRIS, R. E. MEINHARD, J. E. /N. AM. AVIATION/ JUN. 1967
ERC-48

Terminal burn-in or baking step time in the processing of planar silicon devices is extended to reduce their inversion tendencies. The collector-base junction of the device is also cyclically biased during the burn-in.

B67-10179
A THEORETICAL MODEL FOR DETERMINING TURBINE FLOWMETER SENSITIVITY
SMITH, R. L. /N. AM. AVIATION/ JUN. 1967

M-FS-1172

Analytical model of turbine-type flowmeter guides in the selection of valid extrapolation of available calibration data. An expression for flowmeter performance is developed to include the effects of fluid friction, bearing drag, and magnetic drag upon helical rotor design.

B67-10181
STUDY INDICATES FLUID DIGITAL COMPUTATION SYSTEMS ARE FEASIBLE
INNOVATOR NOT GIVEN /GE/ JUN. 1967
M-FS-520

Digital computation systems using fluid amplifiers are proven practical. The response speed is adequate for space applications and they are reliable in adverse environments. The systems may be feasible for satellite attitude controls and guidance computers for manned orbital stations.

B67-10190
SWITCHING-TYPE REGULATOR CIRCUIT HAS INCREASED EFFICIENCY
CLAPP, W. M. /SANDERS ASSOCIATES, INC./ JUN. 1967
MSC-1063

Switching series regulator circuit uses an inductive network to feed most of the current applied to the control circuit to the load. This circuit eliminates resistive losses and the need for heat sinks.

B67-10192
FAST-ACTING CALORIMETER MEASURES HEAT OUTPUT OF PLASMA GUN ACCELERATOR
DETHLEFSON, R. LARSON, A. V. LIEBING, L. /GEN. DYNAMICS/CONVAIR DIV./ JUN. 1967
LEWIS-388

Calorimeter measures the exhaust energy from a shot of a pulsed plasma gun accelerator. It has a fast response time and requires only one measurement to determine the total energy. It uses a long ribbon of copper foil wound around a glass frame to form a reentrant cavity.

B67-10196
TECHNIQUE FOR STRIP CHART RECORDER TIME NOTATION
INNOVATOR NOT GIVEN /ROBACK CORP./ JUN. 1967
GSFC-473

Single recorder channel helps determine the time an event is recorded on the readout of a strip chart recorder. It presents hours, tens of minutes, and minutes by a unique method of time increment identification. This facilitates recording timing marks.

B67-10199
ELECTROMETER AMPLIFIER OPERATES OVER DYNAMIC RANGE OF FIVE ORDERS OF MAGNITUDE
KATZ, N. /MARSHALL LAB./ JUN. 1967
ARC-75

Special purpose electrometer amplifier is capable of operation over a dynamic range of five orders of magnitude. This is achieved by using a zener controlled attenuator in the feedback path for the amplifier.

B67-10201
ELECTRONIC CIRCUITRY USED TO AUTOMATE PAPER CHROMATOGRAPHY
STEFFENSEN, G. R. JUN. 1967
JPL-840

Electronic circuit is used in a paper chromatograph instrument that has excellent sensitivity and furnishes a printed record of each test. The circuit measures and records changes in conductivity in a strip of chromatographic paper as different solutions are placed on it.

B67-10203
AUTOMATED MICROSYRINGE IS HIGHLY ACCURATE AND RELIABLE
STUART, J. L. JUN. 1967
NPO-10142

Syringe meters small volumes of fluid used in chemical analysis. The standard body and plunger are adapted to fit with a motor driven micrometer,

making a reliable and convenient device.

B67-10204
A CONCEPTUAL, PARALLEL OPERATING DATA
COMPRESSION PROCESSOR
ANDERSON, T. O. JUN. 1967
NPO-10068

Data compressor processor concept envisions a simplified system for telemetry communications. It is simultaneously a zero-order processor and a floating aperture, a variable aperture, and a binary integer aperture with a decoded buffet fullness counter.

B67-10205
QUARTZ CRYSTALS DETECT GAS CONTAMINANTS
DURING VACUUM CHAMBER EVACUATION
STEPHENS, J. B. JUN. 1967
NPO-10144

Piezoelectric quartz crystals detect condensable gas contaminants backstreaming into a vacuum chamber when a pump is evacuating the chamber. One crystal acts as a thermometer, the other detects mass change. They are energized by electronic equipment which records frequency changes.

B67-10206
PLOTTER DESIGN SIMPLIFIES DETERMINATION OF
IMAGE SENSOR TRANSFER CHARACTERISTIC
BAKER, L. R. JUN. 1967
NPO-10164

Transfer characteristic of vidicons and other image sensors are measured by light from a calibrated electroluminescent panel as a function of the current output of the image sensor. The plot of current output versus the calibrated light output is the transfer characteristic.

B67-10213
FM CARRIER DEVIATION MEASURED BY
DIFFERENTIAL PROBABILITY METHOD
DAQUIN, A. F., JR. HADDICAN, J. /BOEING CO./
JUN. 1967
M-FS-2166

Differential probability FM system measures deviation of a carrier modulated by a complex signal. The peak-to-peak amplitude is measured and related to the frequency shift of the carrier signal. The deviation is described in terms of a probability as well as a peak value.

B67-10215
RUN NUMBERING SYSTEM FOR USE WITH DATA
RECORDERS
PEASE, L. L. /BOEING CO./ JUN. 1967
M-FS-2557

Run numbering identification system provides a permanent identification on the recorder traces of data runs. It automatically enters, by pulse coding, the number of the current data run on the recorder trace. The system uses a keyboard, registers, converters, amplifiers, and a pulse generator.

02 PHYSICAL SCIENCES (ENERGY SOURCES)

B67-10008
POLAROID FILM HELPS LOCATE OBJECTS IN
INACCESSIBLE AREAS QUICKLY
GRIFFIN, H. G. MC CLELLAND, G. W. /N. AM.
AVIATION/ JAN. 1967
MSC-960

Polaroid film is used with conventional portable X-ray equipment to locate and shoot items or objects in difficult areas. Polaroid film development time is about 20 seconds.

B67-10021
POLARIMETER PROVIDES TRANSIENT RESPONSE
IN NANOSECOND RANGE
JOHNSTON, A. R. FEB. 1967
JPL-890

Conventional polarimeter with a Senarmont compensator improves transient response and eliminates manual manipulation. A sampled

photomultiplier output is fed to a low pass filter, resulting in a signal representing the optical state existing at the instant of sampling. With this technique, an unknown transient-induced retardation can be measured.

B67-10024
PLASMA JET ELECTRODE HAS LONGER OPERATING
LIFE
GRACEY, C. M. /AEROJET GEN. CORP./ FEB. 1967
NU-0098

Water-cooled, silver-infiltrated tungsten electrode has twice the operating lifetime of the pure tungsten electrode used in plasma jet generators. This electrode reduces the erosion rate, ensures excellent heat transfer, and reduces thermal stresses.

B67-10036
NEUTRON ACTIVATION ANALYSIS TRACES COPPER
ARTIFACTS TO GEOGRAPHICAL POINT OF ORIGIN
CONWAY, M. FIELDS, P. FRIEDMAN, A. KASTNER, M.
METTA, D. MILSTED, J. OLSEN, E. MAR. 1967
ARG-119

Impurities remaining in the metallic copper are identified and quantified by spectrographic and neutron activation analysis. Determination of the type of ore used for the copper artifact places the geographic point of origin of the artifact.

B67-10037
CORRELATION ESTABLISHED BETWEEN HEAT TRANSFER
AND ULTRASONIC TRANSMISSION PROPERTIES OF
COPPER BRAZE BONDS
DINQVI, R. A. MAR. 1967 SEE ALSO ANL-7074
ARG-247

Measuring and correlating the thermal conductivity and ultrasonic transmission of seven hot-brazed copper plates established a relationship between heat transfer and ultrasonic transmission properties of the bonds. This relationship permits the prediction of heat transfer characteristics from ultrasonic transmission tests.

B67-10054
METHOD ACCURATELY MEASURES MEAN PARTICLE
DIAMETERS OF MONODISPERSE POLYSTYRENE
LATEXES
KUBITSCHKE, H. E. MAR. 1967
ARG-207

Photomicrographic method determines mean particle diameters of monodisperse polystyrene latexes. Many diameters are measured simultaneously by measuring row lengths of particles in a triangular array at a glass-oil interface. The method provides size standards for electronic particle counters and prevents distortions, softening, and flattening.

B67-10057
MECHANISMS OF SUPERCONDUCTIVITY
INVESTIGATED BY NUCLEAR RADIATION
AUTLER, S. H. COFFEY, H. T. KELLER, E. L.
PATTERSON, A. MAR. 1967
M-FS-1944

Investigation focused on the behavior of superconducting magnet and its constituent materials during and after exposure to nuclear radiation. The results will indicate the feasibility of their use in diverse applications and various environments.

B67-10068
STUDY MADE OF INTERACTION BETWEEN SOUND
FIELDS AND STRUCTURAL VIBRATIONS
LYON, R. H. SMITH, P. W., JR. /BOLT, BERANEK,
AND NEWMAN/ APR. 1967
HQ-26

Study analyzes structural vibrations and the interactions between them and sound fields. It outlines a conceptual framework to analyze the vibrations of systems and their interactions, incorporating the results of earlier studies and establishing a unified basis for continuing research.

B67-10071

ELECTRONIC FILTER DISCRIMINATES BETWEEN TRUE AND FALSE REFLECTIONS
 MERCHANT, J. /HONEYWELL INC./ APR. 1967
 HQ-55

Electronic filtering system discriminates between true corneal and false reflections, solving the problem of spurious reflections of the CRT light in newly designed oculometer.

B67-10072

AN IMPROVED SOFT X-RAY PHOTOIONIZATION DETECTOR
 STOBER, A. K. YOUNG, R. M. APR. 1967
 GSFC-540

Photoionization detector with an alumina shell, a beryllium foil window, and a xenon gas fill measures small incident photon fluxes from soft X-rays. It has high spectral selectivity and quantum efficiencies, and a long shelf life. It minimizes electrical leakage and recontamination, and will hold a high vacuum.

B67-10075

STUDY MADE OF FAR INFRARED SPECTRA OF SILICATE MINERALS
 INNOVATOR NOT GIVEN, /ARTHUR D. LITTLE, INC./ APR. 1967
 M-FS-1811

Study of mineral in the far infrared region of the spectrum examines the problems and feasibility of remote sensing of the composition of the moon or tenuous atmosphere planets. Most of the work described utilized reflection techniques.

B67-10082

FATIGUE ZONES IN METALS IDENTIFIED BY POLARIZED LIGHT PHOTOGRAPHY
 WALSH, F. D. /BOEING CO./ APR. 1967
 WOO-286

Polarized light technique clearly defines the fatigue zones in metal for measuring and photographing. White light is passed through a vertical polarizing filter and then is reflected onto the surface of the fracture specimen.

B67-10088

EXPERIMENTAL SCALING STUDY OF FLUID AMPLIFIER ELEMENTS
 ABLER, J. GREBER, I. TAFT, C. /CASE INST. OF TECH./ APR. 1967
 M-FS-1882

Study examines scaling parameters of three fluid amplifier elements - a bistable device, a boundary layer control device, and a vortex device. Variations in performance due to size, fluid, and other conditions are studied. Even with restricted examples the large number of variables impedes the establishment of these scaling laws.

B67-10109

SPECIAL PURPOSE REFLECTOMETER USES MODIFIED ULBRICHT SPHERE
 GORSTEIN, M. /MIT/ MAY 1967
 MSC-1135

Modified Ulbricht sphere measures stray radiation caused by irregularities in the reflective surface of an optical test specimen. The test specimen is positioned between a light source and exit port and all diffusely scattered radiation is measured by a photomultiplier tube in the sphere.

B67-10110

STAR/HORIZON SIMULATOR USED TO TEST SPACE GUIDANCE SYSTEM
 SCHMIDT, W. C. /MIT/ MAY 1967
 MSC-407

Star/horizon simulator is used for alignment and optical plus photoelectric tests of the sextant for the Apollo guidance and navigation system Optical Unit Assembly. The unit is basically a refractive collimator with a two-inch objective lens system and a twenty-four-inch focal length.

B67-10120

VISUAL ATTITUDE ORIENTATION AND ALIGNMENT SYSTEM
 BEAM, R. A. MORRIS, D. B. /N. AM. AVIATION/ MAY 1967

MSC-647

Active vehicle optical alignment aid and a passive vehicle three-dimensional alignment target ensure proper orientation and alignment plus control of the closure range and rate between two bodies, one in controlled motion and one at rest.

B67-10126

HIGH-ENERGY-RATE MAGNETOHYDRAULIC METAL FORMING SYSTEM
 INNOVATOR NOT GIVEN /ADVANCE KINET./ MAY 1967
 M-FS-2142

In the magnetohydraulic metal forming system, a sonic shock wave is generated in a liquid medium by a coil energized by an electrical discharge. These waves transfer energy from a metal diaphragm, actuated by a pulsed magnetic field, to a metal workpiece. In this development a study was made of the pressure-pulse phenomenon in a liquid medium.

B67-10128

IMPROVED CRYOGENIC REFRIGERATION SYSTEM
 HIGA, W. H. MAY 1967
 JPL-731

Two-position shuttle valve simplifies valving arrangement and crank-shaft configuration in gas-balancing and Stirling-cycle refrigeration systems used to produce temperatures below 173 degrees K. It connects the displacer and regenerator alternately to the supply line or the return line of the compressor, and establishes constant pressure on the drive piston.

B67-10131

NEUTRON DIFFRACTOMETER ALLOWS BOTH MAGNETIC AND CRYSTALLOGRAPHIC ANALYSES
 ATOJI, M. JUN. 1967 SEE ALSO ANL-6920
 ARG-191

Automatic double-crystal neutron diffractometer performs both crystal and magnetic structural analyses. This shielded installation has a goniometric turntable and electronic controls, and auxiliary equipment including a goniometer, diffraction electromagnet, two cryogenic dewars, and two diffraction furnaces.

B67-10134

CRYOGENIC SEAL REMAINS LEAKTIGHT DURING THERMAL DISPLACEMENT
 FIELDS, T. H. MARTIN, K. B. PEWITT, E. G. MAY 1967
 ARG-96

Cryogenic seals protect the surfaces of a plastic member in a low-pressure system subjected to extreme temperature changes. The outer seal is an aluminum expansion ring bonded to the lens outer surface and the inner seal consists of a resin-filled aluminum U-ring bonded to the inner surface.

B67-10164

SOLAR X-RAY SPECTRUM REPRODUCED IN VACUUM
 ERDMAN, C. A. KIRCHNER, L. P. /IIT RES. INST./ JUN. 1967
 MSC-228 MSC-1168

Desired low energy X-rays are produced by modifying commercial ion tubes and combining them with standard power supplies and control circuitry. These X-rays have less deviation from the solar X-ray spectrum in energy and intensity.

B67-10216

ELECTRON BEAM WELDER X-RAYS ITS OWN WELDS
 RODEN, W. A. /GEN. DYNAMICS/CONVAIR DIV./ JUN. 1967
 LEWIS-10111

Beam of an electron beam welder X-rays its own welds, enabling rapid weld quality checks to be made without removing the work from the vacuum chamber. A tungsten target produces X-rays when hit by the beam. They are directed at the weld specimen and recorded on polaroid film.

03 MATERIALS (CHEMISTRY)

B67-10003

NEW ELECTROLYTE MAY INCREASE LIFE OF
POLAROGRAPHIC OXYGEN SENSORS
ALBRIGHT, C. F. /GARRETT CORP./ JAN. 1967
MSC-1049

Electrolyte increases life on oxygen sensors in a polarograph used for measuring the partial pressure of oxygen in a gas mixture. It consists of a solution of lithium chloride, dimethyl acetamide and water.

B67-10007

COMPOSITES OF POROUS METAL AND SOLID
LUBRICANTS INCREASE BEARING LIFE
SLINEY, H. E. JAN. 1967
LEWIS-307

Self-lubricating composites of porous nickel and nickel-chromium alloy impregnated with a barium fluoride-calcium fluoride eutectic, and a thin film of solid lubricant increase wear life of load bearing surfaces.

B67-10012

CRYSTAL MICROBALANCE MEASURES CONDENSABLE
MOLECULAR FLUXES
STEPHENS, J. B. JAN. 1967
JPL-845

Quartz crystal quantitatively measures molecular fluxes emanating from and condensing on spacecraft surfaces. Vibrating in a thickness shear mode the crystal is frequency sensitive to changes in mass on its surface and can measure a fractional monolayer of a condensate.

B67-10014

ABRADED CADMIUM-PLATED CABLE CONNECTORS
REPAIRED BY CONVERSION COATING
SIMMONS, J. R. /BOEING CO./ JAN. 1967
M-FS-1424

Conversion coating procedures repairs scratched and abraded cadmium-plated aluminum cable connectors while they are in assembly.

B67-10016

DISPERSION OF BORAX IN PLASTIC IS EXCELLENT
FIRE-RETARDANT HEAT INSULATOR
EVANS, H. HUGHES, J. SCHMITZ, F. JAN. 1967
ARG-5

A mix of borax powder and a chlorinated anhydrous polyester resin yields a plastic composition that is fire-retardant, yields a minimum of toxic gases when heated, and exhibits high thermal insulating properties. This composition can be used as a coating or can be converted into laminated or cast shapes.

B67-10026

BERYLLIUM FLUORIDE FILM PROTECTS BERYLLIUM
AGAINST CORROSION
ODONNELL, P. M. FEB. 1967
LEWIS-363

Film of beryllium fluoride protects beryllium against corrosion and stress corrosion cracking in water containing chloride ion concentrations. The film is formed by exposing the beryllium to fluorine gas at 525 degrees C. or higher and makes beryllium suitable for space applications.

B67-10032

FLUID-BED FLUORIDE VOLATILITY PROCESS
RECOVERS URANIUM FROM SPENT URANIUM ALLOY
FUELS

BARGHUSEN, J. J. CHILENSKAS, A. A. GUNDERSON, G. E. HOLMES, J. T. JONKE, A. A. KINCINAS, J. E. LEVITZ, N. M. POTTS, G. L. RAMASWAMI, D. STETHERS, H. TURNER, K. S. MAR. 1967 SEE ALSO
ANL-6979, ANL-6829, ANL-6830, ANL-6973, ANL-6992, ANL-6994
ARG-232

Fluid-bed fluoride volatility process recovers uranium from uranium fuels containing either zirconium or aluminum. The uranium is recovered as uranium hexafluoride. The process requires

few operations in simple, compact equipment, and eliminates aqueous radioactive wastes.

B67-10033

HYDRATED MULTIVALENT CATIONS ARE NEW CLASS
OF MOLTEN SALT MIXTURES
ANGELL, C. A. MAR. 1967
ARG-211

Electrical conductance and activation energy measurements on mixtures of calcium and potassium nitrate show the hydrated form to be a new class of molten salt. The theoretical glass transition temperature of the hydrate changed inversely to the anhydrous mixture.

B67-10034

TWO TECHNIQUES ENABLE SAMPLING OF FILTERED
AND UNFILTERED MOLTEN METALS
BURRIS, L., JR. PIERCE, R. D. TOBIAS, K. R. WINSCH, I. O. MAR. 1967 SEE ALSO ANL-7088
ARG-150

Filtered samples of molten metals are obtained by filtering through a plug of porous material fitted in the end of a sample tube, and unfiltered samples are obtained by using a capillary-tube extension rod with a perforated bucket. With these methods there are no sampling errors or loss of liquid.

B67-10044

IRRADIATED GASES TRANSFERRED WITHOUT
CONTAMINATION OR DILUTION
BONN, J. L. KERN, W. MAR. 1967
LEWIS-278

Vacuum chamber apparatus opens sealed canisters of irradiated gases and transfers the contents without contaminating the surrounding area, diluting or polluting the contained gases. The apparatus consists of the chamber, a valved piping manifold, and a special drill and sealed drilling access.

B67-10049

CRYOGENIC FATIGUE DATA DEVELOPED FOR INCONEL
718
SCHMIDT, E. H. /N. AM. AVIATION/ MAR. 1967
M-FS-702

Data were obtained on the cryogenic fatigue properties of Inconel 718 bar using axial loading and rotating beam fatigue tests. Results also disclosed the fatigue properties of Inconel 718 sheet materials.

B67-10050

ZIRCONIUM ALLOYS WITH SMALL AMOUNTS OF IRON
AND COPPER OR NICKEL SHOW IMPROVED CORROSION
RESISTANCE IN SUPERHEATED STEAM
GREENBERG, S. YOUNGDAHL, C. A. MAR. 1967
ARG-226

Heat treating various compositions of zirconium alloys improve their corrosion resistance to superheated steam at temperatures higher than 500 degrees C. This increases their potential as fuel cladding for superheated-steam nuclear-fueled reactors as well as in autoclaves operating at modest pressures.

B67-10051

STUDY MADE OF CORROSION RESISTANCE OF
STAINLESS STEEL AND NICKEL ALLOYS IN NUCLEAR
REACTOR SUPERHEATERS
GREENBERG, S. HART, R. K. LEE, R. H. RUTHER, W. E. SCHLUETER, R. R. MAR. 1967
ARG-230

Experiments performed under conditions found in nuclear reactor superheaters determine the corrosion rate of stainless steel and nickel alloys used in them. Electropolishing was the primary surface treatment before the corrosion test. Corrosion is determined by weight loss of specimens after defilming.

B67-10058

ADDITION OF SOLID OXIDIZER INCREASES LIQUID
FUEL SPECIFIC IMPULSE
HENDEL, F. J. APR. 1967
JPL-861

Adding soluble solid oxidizers to hydrazine and similar fuels makes them useful in low temperature

bipropellant systems. These oxidizers improve the low specific impulse, high freezing point, low boiling point, and low density of the fuels.

B67-10062

RECOMMENDED VALUES OF THE THERMOPHYSICAL PROPERTIES OF EIGHT ALLOYS, THEIR MAJOR CONSTITUENTS AND OXIDES

TOULOUKIAN, Y. S. /PURDUE UNIV./ MAR. 1967

NU-0095

Reference work provides in tabular and graphical form the thermophysical properties of basic alloys, their constituents and oxides. This is useful for personnel who deal with extreme temperature environments.

B67-10069

CONTROLLED FERRITE CONTENT IMPROVES

WELDABILITY OF CORROSION-RESISTANT STEEL

MALIN, C. O. /N. AM. AVIATION/ APR. 1967

M-FS-568

Corrosion-resistant steel that adds restrictions on chemical composition to ensure sufficient ferrite content decreases the tendency of CRES to develop cracks during welding. The equations restricting composition are based on the Schaeffler constitution diagram.

B67-10070

RADIAL FURNACE SHOWS PROMISE FOR GROWING

STRAIGHT BORON CARBIDE WHISKERS

FEINGOLD, E. /GE/ APR. 1967

HQ-50

Radial furnace, with a long graphite vaporization tube, maintains a uniform thermal gradient, favoring the growth of straight boron carbide whiskers. This concept seems to offer potential for both the quality and yield of whiskers.

B67-10078

PURIFICATION TRAIN PRODUCES ULTRAPURE

HYDROGEN GAS

WALTER, R. J. /N. AM. AVIATION/ APR. 1967

M-FS-1913

Three-stage purification train produces ultrapure hydrogen gas at 1000 psi from K-bottles of high-purity hydrogen. The continuous process incorporates deoxidation and dehydration units and a molecular sieve.

B67-10079

ARYLENESILOXANE COPOLYMERS

BREED, L. W. ELLIOTT, R. L. /MIDWEST RES. INST./

APR. 1967

M-FS-1812

Arylenesiloxane copolymers with regularly ordered structures were discovered during efforts to develop organosilicon polymers. Arylenesilane and siloxane monomers were both synthesized in these experiments.

B67-10083

EFFECTS OF HELIUM AND NITROGEN AS

PRESSURANTS IN NITROGEN TETROXIDE TRANSFER

BIZJAK, F. SIMKIN, D. J. /N. AM. AVIATION/ APR. 1967

MSC-924

MSC-925

Study investigates effects of helium and nitrogen as pressurants in nitrogen tetroxide transfer from one vessel to another at a higher elevation. Results may contribute to creation of new environmental systems and improved oxygen solubility in water to promote fish life.

B67-10089

MATERIALS DATA HANDBOOKS PREPARED FOR

ALUMINUM ALLOYS 2014, 2219, AND 5456, AND

STAINLESS STEEL ALLOY 301

INNOVATOR NOT GIVEN. /SYRACUSE UNIV. RES. INST./

APR. 1967

M-FS-1959 M-FS-1960 M-FS-1961 M-FS-1962

Materials data handbooks summarize all presently known properties of commercially available structural aluminum alloys 2014, 2219, and 5456 and structural stainless steel alloy 301. The information includes physical and mechanical property data and design data presented in tables, illustrations, and text.

B67-10095

IMPROVED CHLORATE CANDLE PROVIDES

CONCENTRATED OXYGEN SOURCE

HAUG, R. D. MYERS, D. A. TANZAR, G. F. /GARRETT

CORP./ MAR. 1967

MSC-1137

Improved chlorate candle is used as a solid, portable source of oxygen in emergency situations. It contains sodium chlorate, iron, barium peroxide, and glass, mixed in powdered form. The oxygen evolves from the decomposition of the sodium chlorate when an ignition pellet is electrically initiated.

B67-10100

SYNTHESIS OF VARIOUS HIGHLY HALOGENATED

MONOMERS AND POLYMERS

HOLLANDER, J. TRISCHLER, F. D. /WHITTAKER CORP./

APR. 1967 SEE ALSO B66-10646

M-FS-2143

Halogenated polyurethane and polycarbonate are synthesized and found to be LOX compatible but dependent upon the type nitrogen bonding.

B67-10102

SIMPLIFIED METHOD INTRODUCES DRIFT FIELDS

INTO CELLS

GOLDSTEIN, B. RAPPAPORT, P. WYSOCKI, J. J.

/RCA/ APR. 1967

GSCF-572

Drift fields are simply introduced into solar cells at low temperatures in short periods. This is done after their rectifying junctions and output contacts are applied.

B67-10112

THERMODYNAMIC PROPERTIES RELATED TO

EXPANSION OF TWO-COMPONENT GAS

BIZJAK, F. /N. AM. AVIATION/ APR. 1967

MSC-1133

Theoretical equations were derived from basic thermodynamic equations to relate the thermodynamic properties of a two-component gas mixture to the expansion of the gas during tank ullage blowdown.

B67-10113

NONWOVEN GLASS FIBER MAT REINFORCES

POLYURETHANE ADHESIVE

ROSELAND, L. M. /DOUGLAS AIRCRAFT CO./ MAY 1967

M-FS-2309

Nonwoven glass fiber mat reinforces the adhesive properties of a polyurethane adhesive that fastens hardware to exterior surfaces of aluminum tanks. The mat is embedded in the uncured adhesive. It ensures good control of the bond line and increases the peel strength.

B67-10121

PORTABLE FIXTURE FACILITATES PRESSURE

TESTING OF INSTRUMENTATION FITTINGS

OLSON, G. A. /BOEING CO./ MAY 1967

M-FS-2032

Portable fixture facilitates pressure testing to detect possible leaks in instrumentation fittings mounted on tank bulkheads. It uses a vacuum cup which seals a pressure regulator adapter around one side of the fitting to be pressure tested. Leakage is detected with a gas sniffer.

B67-10122

EVALUATION OF HIGH TEMPERATURE STRANDED

HOOKEUP WIRE

DONNELLY, J. H. MOORE, H. J., JR. MAY 1967 SEE

ALSO NASA-TM-X-53522

M-FS-2478

Tests are performed on wire and insulation materials to determine selection for electronic space assemblies. Wire characteristics of tensile strength, flexibility, conductivity, and general workability are tested. Knowledge of the advantages and limitations of these materials should prevent overspecification.

B67-10124

SILVER PLATING ENSURES RELIABLE DIFFUSION

BONDING OF DISSIMILAR METALS

INNOVATOR NOT GIVEN /BOEING CO./ MAY 1967

M-FS-1975

Dissimilar metals are reliably joined by diffusion bonding when the surfaces are electroplated with silver. The process involves cleaning and etching, anodization, silver striking, and silver plating with a conventional plating bath. It minimizes the formation of detrimental intermetallic phases and provides greater tolerance of processing parameters.

B67-10132

STATIC ELECTRICITY OF POLYMERS REDUCED BY TREATMENT WITH IODINE

HERMANN, A. M. LANDEL, R. F. REMBAUM, A. MAY 1967

NPO-10062

Treating organic polymers with iodine improves the electrical conductivity. Diffusion enables products of desired properties to be custom formulated. This eliminates a buildup of static electricity and the need for fillers or bound metal salts.

B67-10133

XENON FLUORIDE SOLUTIONS EFFECTIVE AS FLUORINATING AGENTS

HYMAN, H. H. QUARTERMAN, L. A. SHEFT, I. MAY 1967

ARG-217

Solutions of xenon fluorides in anhydrous hydrogen fluoride have few disruptive effects and leave a residue consisting of gaseous xenon, which can be recovered and refluorinated. This mild agent can be used with materials which normally must be fluorinated with fluorine alone at high temperatures.

B67-10138

STATUS OF ULTRACHEMICAL ANALYSIS FOR SEMICONDUCTORS

DILTS, R. V. HALL, L. C. /VANDERBILT UNIV./ MAY 1967

M-FS-2254

Status of ultratrace chemical analyses of materials for semiconductors was studied. This study covered atomic absorption spectroscopy, emission spectroscopy, and activation analyses. It makes recommendations to improve sensitivity, reliability and versatility for ultratrace chemical analysis.

B67-10141

STUDY TO MINIMIZE HYDROGEN EMBRITTLEMENT OF ULTRAHIGH-STRENGTH STEELS

ELSEA, S. T. FLETCHER, E. E. GROENEVELD, T. P. /BATTELLE MEM. INST./ MAY 1967

M-FS-2455

Hydrogen-stress cracking in high-strength steels is influenced by hydrogen content of the material and its hydrogen absorption tendency. Non-embrittling cleaning, pickling, and electroplating processes are being studied. Protection from this hydrogen embrittlement is important to the aerospace and aircraft industries.

B67-10147

DEGREASING OF TITANIUM TO MINIMIZE STRESS CORROSION

CARPENTER, S. R. /GEN. DYNAMICS/CONVAIR DIV./ MAY 1967

LEWIS-382

Stress corrosion of titanium and its alloys at elevated temperatures is minimized by replacing trichloroethylene with methanol or methyl ethyl ketone as a degreasing agent. Wearing cotton gloves reduces stress corrosion from perspiration before the metal components are processed.

B67-10148

CRACKS IN GLASS ELECTRICAL CONNECTOR HEADERS REMOVED BY DRY BLASTING WITH FINE ABRASIVE

ECKERT, R. W. /GEN. DYNAMICS/CONVAIR DIV./ MAY 1967

LEWIS-381

Cracking that causes pressure leakage in glass connector headers can be alleviated by manipulating the pin bridgewire connectors. This initiates the surface and meniscus cracks. Dry

blasting the header surface with a fine abrasive then removes the cracks.

B67-10149

COATING PROTECTS MAGNESIUM-LITHIUM ALLOYS AGAINST CORROSION

INNOVATOR NOT GIVEN /AM. MACHINE AND FOUNDRY CO./ MAY 1967 SEE ALSO NASA-SP-50-68

M-FS-2446

Coating protects newly developed magnesium-lithium alloys against corrosion. The procedure includes heating the ingots in a salt bath and rolling them to the desired sheet thickness. The black coating, which is tough though thin and ductile, is derived mainly from chromium.

B67-10159

HEAT TREATMENT STUDY OF ALUMINUM CASTING ALLOY M45

LOVOY, C. V. JUN. 1967 SEE ALSO B65-10092

M-FS-2397

Study determines the heat treatment cycle of aluminum casting alloy M45 which will increase the strength levels of the alloy while maintaining optimum stress corrosion resistance. Evidence indicates that present production castings are overaged too severely to take full advantage of the strength of the alloy.

B67-10163

EFFECTS OF HEAT INPUT RATES ON T-1 AND T-1A STEEL WELDS

DAVIS, R. A. OLSEN, M. G. WORDEN, S. W. JUN. 1967 SEE ALSO NASA TM-X-53537

M-FS-2475

Technology of T-1 and T-1A steels is emphasized in investigation of their weld-fabrication. Welding heat input rate, production weldment circumstances, and standards of welding control are considered.

B67-10168

ISOSTATIC COMPRESSION PROCESS CONVERTS POLYAROMATICS INTO STRUCTURAL MATERIAL

INGHAM, J. D. LAWSON, D. D. OSTRUM, G. K. JUN. 1967

JPL-892

Isostatic compression process compacts certain powdered aromatic polymers into homogeneous materials that can be machined to form useful components, such as bearings. It provides for complete removal of air in the interstitial spaces surrounding the granules of the powdered polymer before the powder is subjected to isostatic compression.

B67-10182

STRESS CALCULATOR SPEEDILY CONVERTS STRAIN DATA

CORNETT, D. W. /BOEING CO./ JUN. 1967

M-FS-2021

Stress calculator permits speedy conversion of strain data directly into maximum and minimum stresses and also determines stress direction. The calculator has a movable slide with logarithmic and linear scales, and an information and grid board. Its size is flexible for easy manipulation.

B67-10184

NEW CLASS OF COMPOUNDS HAVE VERY LOW VAPOR PRESSURES

ANGELL, C. A. GRUEN, D. M. JUN. 1967

ARG-115

Magnesium hexahydrate tetrachlorometallates are 50-volume-percent water, have a high melting point and possess a low vapor pressure. These new compounds are relatively noncorrosive, thermally stable, and water soluble but not hygroscopic. They may have potential applications as cooling fluids.

B67-10185

XENON FLUORIDES SHOW POTENTIAL AS FLUORINATING AGENTS

CHEERNICK, C. L. SHIEH, T. C. YANG, N. C. JUN. 1967

ARG-113

Xenon fluorides permit the controlled addition of

fluorine across an olefinic double bond. They provide a series of fluorinating agents that permit ready separation from the product at a high purity. The reactions may be carried out in the vapor phase.

B67-10186
ALPHA PARTICLE BACKSCATTERING MEASUREMENTS
USED FOR CHEMICAL ANALYSIS OF SURFACES
PATTERSON, J. H. JUN. 1967
ARG-116

Alpha particle backscattering performs a chemical analysis of surfaces. The apparatus uses a curium source and a semiconductor detector to determine the energy spectrum of the particles. This in turn determines the chemical composition of the surface after calibration to known samples.

B67-10187
OXIDE FILM ON METAL SUBSTRATE REDUCED TO
FORM METAL-OXIDE-METAL LAYER STRUCTURE
YOUNGDAHL, C. A. JUN. 1967
ARG-48

Electrically conductive layer of zirconium on a zirconium-oxide film residing on a zirconium substrate is formed by reducing the oxide in a sodium-calcium solution. The reduced metal remains on the oxide surface as an adherent layer and seems to form a barrier that inhibits further reaction.

B67-10189
IRON SERVES AS DIFFUSION BARRIER IN
THERMALLY REGENERATIVE GALVANIC CELL
CROUTHAMEL, C. E. JUN. 1967
ARG-29

Pure iron or iron-coated diaphragm provides a hydrogen diffusion electrode for a thermally regenerative galvanic cell. It allows the gas to diffuse through its interatomic spaces and resists the corrosive action of the cell environment.

B67-10191
SOLUBILITY DATA ARE COMPILED FOR METALS IN
LIQUID ZINC
DILLON, I. G. JOHNSON, I. JUN. 1967 SEE ALSO
ANL-7083
ARG-149

Available data is compiled on the solubilities of various metals in liquid zinc. The temperature dependence of the solubility data is expressed using the empirical straight line relationship existing between the logarithm of the solubility and the reciprocal of the absolute temperature.

B67-10194
SEPARATION TECHNIQUE PROVIDES RAPID
QUANTITATIVE DETERMINATION OF CESIUM-137
IN IRRADIATED NUCLEAR FUEL
ELLENBURG, E. J. MC COWN, J. J. /WESTINGHOUSE
ASTRONUCL. LAB./ JUN. 1967
NUC-10047

Potassium cobalt ferrocyanide is used to determine cesium-137 activity in irradiated fuel samples. It preferentially removes cesium from an acid solution of the fuel material. The residue is filtered and analyzed with a gamma spectrometer.

B67-10197
NEW CLASS OF THERMOSETTING PLASTICS HAS
IMPROVED STRENGTH, THERMAL AND CHEMICAL
STABILITY
BURNS, E. A. DUBROW, B. LUBOWITZ, H. R. /TRW
SYSTEMS/ JUN. 1967
LEWIS-10108

New class of thermosetting plastics has high hydrocarbon content, high stiffness, thermal stability, humidity resistance, and workability in the precured state. It is designated cyclized polydiene urethane, and is applicable as matrices to prepare chemically stable ablative materials for rocket nose cones of nozzles.

B67-10208
STUDY MADE OF RANEY NICKEL TECHNOLOGY
LEE, W. B. /MARQUADT CORP./ JUN. 1967
M-FS-2054

Raney nickel study indicates that its improved storage life is due to gaseous hydrogen and that

the mechanism of its ignitions is catalytic and due to chemisorbed hydrogen atoms. It shows that reacted Raney nickel powder can be reactivated and can introduce multiple ignitions in a hydrogen gas stream.

B67-10209
POROUS MANDRELS PROVIDE UNIFORM
DEFORMATION IN HYDROSTATIC POWDER
METALLURGY
GRIPSHOVER, P. J. HANES, H. D. /BATTELLE MEM.
INST./ JUN. 1967
M-FS-1972

Porous copper mandrels prevent uneven deformation of beryllium machining blanks. The beryllium powder is arranged around these mandrels and hot isostatically pressed to form the blanks. The mandrels are then removed by leaching.

04 LIFE SCIENCES

B67-10005
DIGITAL COMPUTER PROCESSING OF X-RAY PHOTOS
NATHAN, R. SELZER, R. H. JAN. 1967
JPL-792

Digital computers correct various distortions in medical and biological photographs. One of the principal methods of computer enhancement involves the use of a two-dimensional digital filter to modify the frequency spectrum of the picture. Another computer processing method is image subtraction.

B67-10056
ADJUSTABLE HINGE PERMITS MOVEMENT OF KNEE
IN PLASTER CAST
MALEY, W. E. MAR. 1967
M-FS-1756

Metal knee hinge with an adjustable sleeve worn on the outside of a leg cast facilitates movement of the knee joint. This helps eliminate stiffness of the knee and eliminates bulkiness and adjustment difficulty.

B67-10114
INTEGRATED MOBILITY MEASUREMENT AND NOTATION
SYSTEM
ROEBUCK, J. A., JR. /N. AM. AVIATION/ MAY 1967
MSC-726

System for description of movements and positions facilitates design of space suits with more mobility. This measurement and notation system gives concise and unequivocal descriptions, compatible with engineering analysis and applicable to specific needs.

B67-10129
ION EXCHANGE DETERMINES IODINE-131
CONCENTRATION IN AQUEOUS SAMPLES
FAIRMAN, W. D. SEDLET, J. MAY 1967
ARG-208

Inorganic radiiodide in aqueous media is analyzed by separating the radioactive iodine-131 as the iodide ion on a silver chloride column. The activity in the final precipitate may be determined by beta or gamma counting.

B67-10188
URANYL PHTHALOCYANINES SHOW PROMISE IN THE
TREATMENT OF BRAIN TUMORS
FRIGERIO, N. A. JUN. 1967 SEE ALSO ANL-6910
ARG-100

Processes synthesize sulfonated and nonsulfonated uranyl phthalocyanines for application in neutron therapy of brain tumors. Tests indicate that the compounds are advantageous over the previously used boron and lithium compounds.

B67-10207
SELF-SEALING CLOSURE ENABLES ACCESS TO
SEVERAL FLUID CONTAINERS
WHEELER, S. B. JUN. 1967
NPO-10123

Self-sealing closure enables small amounts of specific biochemical solutions to be withdrawn from or added to containers in inaccessible or

small spaces. It uses a self-sealing septum of a silicone elastomer through which a hypodermic needle can be inserted.

05 MECHANICAL

B67-10004

MICROMANIPULATION TOOL IS EASILY ADAPTED TO MANY USES
SHLICHTA, P. J. JAN. 1967
JPL-129

A special micromanipulation tool equipped with a plunger mounted in a small tube can be easily adapted to such work operations as cutting, precision clamping, and spot welding of microscopic filaments or other parts. This tool is valuable where extreme steadiness of high magnification is required.

B67-10006

COMPLEX SURFACES PLATED BY THIN-FILM DEPOSITION IN ONE OPERATION
BUCKLEY, D. H. PRZYBYSEWSKI, J. S. SPALVINS, T. JAN. 1967
LEWIS-292

Ion plating deposits thin film on complex surface in one operation. The ionized materials follow electric lines of force to all points on the objects, uniformly plating the surface from all sides simultaneously.

B67-10010

PROCESS SEQUENCE PRODUCES STRONG, LIGHTWEIGHT REFLECTORS OF EXCELLENT QUALITY
READER, A. F. RUSSELL, W. E. WERNER, E. A. FEB. 1967
LEWIS-331

Large compound curved surfaces for collecting and concentrating radiation are fabricated by the use of several common machining and forming processes. Lightweight sectors are assembled into large reflectors. With this concept of fabrication, integrally stiffened reflective sectors up to 25 square feet in area have been produced.

B67-10011

ELASTIC GUIDES REDUCE HYSTERESIS EFFECT IN BELLEVILLE SPRING PACKAGE
MC GLASHAN, F., JR. TOOTH, L. R. JAN. 1967
JPL-910

Peripheral support guides that elastically flex with the slight breathing on radial displacement during actuation can greatly reduce the hysteresis present in a Belleville spring package. This technique provides a control device that enhances the precision of pressure regulating valves, pressure switches, of vacuum actuators.

B67-10018

TECHNIQUE CUTS TIME AND COST OF BENDING JACKETED PIPING
GARDNER, J. N. /N. AM. AVIATION/ FEB. 1967
WSO-333

Technique uses a stiff medium in the annular space between inner and outer pipes of jacketed piping in transfer lines. The process eliminates splitting and welding and makes possible the use of standard pipe-bending tools.

B67-10019

ORBITAL TUBE FLARING SYSTEM PRODUCES TUBING CONNECTORS WITH ZERO LEAKAGE
WILLIAMS, J. R. FEB. 1967
M-FS-2016

An orbital tube flaring system produces tubing connectors with a zero-leak potential needed in high pressure hydraulic and pneumatic systems. The flaring system incorporates a rolling cone and rolling die to closely control flare characteristics.

B67-10023

TESTS SHOW THAT ALUMINUM WELDS ARE IMPROVED BY BEAD REMOVAL
HOOD, D. W. /BOEING CO./ FEB. 1967
M-FS-1817

Tests with 2218-T87 aluminum alloy plate indicate improvements in strength, ductility, fatigue properties, and burst pressure result when one or both of the top and bottom weld beads are removed. There is, however, a drop in yield strength. The consistency of test data is considerably improved by weld bead removal.

B67-10039

SIMPLE PUMP MAINTAINS LIQUID HELIUM LEVEL IN CRYOSTAT
BUCHHOLD, T. A. /GE/ MAR. 1967
M-FS-1763

Reciprocating pump maintains a precise level of liquid helium in a cryostat. The pump contains a niobium solenoid armature that is maintained in a superconductive state by the liquid helium.

B67-10043

HIGH SPEED BLOWDOWN SYSTEM PROVIDES RAPID PRESSURE LOSS
BRITTAN, H. C. /GEN. DYN./CONVAIR/ MAR. 1967
LEWIS-375

High speed blowdown takes advantage of discretely maintained differential pressures to vent a test chamber from high to ambient pressure with minimum time lag. This technique is advantageous where the use of pyrotechnics is undesirable.

B67-10045

RESISTANCE HEATING RELEASES STRUCTURAL ADHESIVE
GLEMSEY, N. N. /BOEING CO./ MAR. 1967
M-FS-1607

Composite adhesive package bonds components together for testing and enables separation when testing is completed. The composite of adhesives, insulation and a heating element separate easily when an electrical current is applied.

B67-10047

VISCO SEAL DESIGN OFFERS ZERO-LEAKAGE AND WEAR-FREE CHARACTERISTICS
KETOLA, H. N. MC GREW, J. M. /GE/ MAR. 1967 SEE ALSO NASA-TM-X-52245
WSO-329

Study provides specific design criteria in sealing applications for continuous duty pumps used in bulk liquid transfer. A basic sealing equation predicts visco seal performance in the turbulent regime.

B67-10048

TECHNIQUE FOR STRIPPING TEFLON INSULATED WIRE
BABB, B. D. /HAYES INTERN. CORP./ MAR. 1967
M-FS-1774

Cryogenic stripping of Teflon insulated wire leaves no residue and produces no physical damage. After the wire is immersed in liquid nitrogen, bent slightly, and returned to room temperature, the Teflon is removed by fingernails or flat-nosed pliers.

B67-10052

LABORATORY ARC FURNACE FEATURES INTERCHANGEABLE HEARTHS
ARMSTRONG, J. L. KRUGER, O. L. MAR. 1967
ARG-125

Laboratory arc furnace using rapidly interchangeable hearths gains considerable versatility in casting so that buttons or special shaped castings can be produced. It features a sight glass for observation.

B67-10059

VACUUM CHAMBER IS REMOTELY SEALED BY EUTECTIC METAL
CORDOVA, R. SACOANE, G. H. /AEROJET-GEN. CORP./ APR. 1967
NU-0091

Vacuum chamber is remotely sealed by a design using metal seal blades which are inserted into a molten eutectic metal by pressurizing an expansion bellows. The process increases allowable manipulations by improving working space and safety factors.

B67-10063

FLUIDIC OSCILLATOR USED AS HUMIDITY SENSOR
PROKOPIUS, P. R. MAR. 1967
LEWIS-340

Fluidic oscillator measures the humidity of the hydrogen stream leaving a hydrogen-oxygen fuel cell. The instrument provides continuous readings with a certain speed of response.

B67-10064

NEGATIVE FEEDBACK SYSTEM REDUCES PUMP
OSCILLATIONS
ROSENMAN, W. /N. AM. AVIATION/ MAR. 1967
M-FS-1852

External negative feedback system counteracts low frequency oscillations in rocket engine propellant pumps. The system uses a control piston to sense pump discharge fluid on one side and a gas pocket on the other.

B67-10066

HOLDING FIXTURE FACILITATES PIPE THREAD
GAGE MEASUREMENTS
CUPPS, B. HILL, J. /N. AM. AVIATION/ MAR. 1967
M-FS-2009

Holding fixture that holds the thread gage and three wires in the proper relationship facilitates the measurement of the pitch diameter of the tapered threads of a pipe thread gage. Modified, this device can be used to involute spur gears.

B67-10067

ADJUSTABLE, SELF-LOCKING LADDER INCLUDES
OPTIONAL WORK PLATFORM
WEBSTER, R. E. /N. AM. AVIATION/ APR. 1967
M-FS-1922

Height-adjustable ladder with a self-locking platform at its top makes elevated locations more accessible, increases the quantity and size of tools handled there, and decreases the risk of disturbance or damage to components. The retractable platform adapts the ladder to normal use.

B67-10073

COLDPLATE OF PIN FIN DESIGN MAKES EFFICIENT
HEAT EXCHANGER
DYER, W. F. /N. AM. AVIATION/ APR. 1967
MSC-1093

Flat, hollow coldplate that permits the flow of coolant liquid within it removes heat from heat-generating electronic equipment. This coldplate solves usual problems of bulk, weight, and excessive pumping requirements.

B67-10081

RIGID-BODY MOTION EXTRACTED FROM TOTAL
MOTION OF A FLEXIBLE BODY
HOWARD, J. C. APR. 1967
ARC-63

Control system eliminates or reduces flexibility effects on the manual and automatic control of large flexible vehicles. It extracts rigid-body and flexible-body motion and adapts well when a flexible-body frequency coincides or nearly coincides with the control mode frequency.

B67-10094

ULTRASONICS PERMITS BRAZING COMPLEX STAINLESS
STEEL ASSEMBLY WITHOUT FLUX
BAKER, W. H. /WESTINGHOUSE ASTRONUCL. LAB./ APR. 1967
NU-0115

Ultrasonic vibration of an assembly of stainless steel instrumentation tubes ensures brazing without flux. Vibration with an ultrasonic transducer permits the brazing material to flow down each tube in contact with a seal plug installed in a pressure vessel wall.

B67-10096

UNDERCOAT PREVENTS BLISTERING OF SILVER
PLATING AT ELEVATED TEMPERATURES
KUSTER, C. A. /N. AM. AVIATION/ APR. 1967
M-FS-2049

Gold undercoat prevents blistering in the silver plating of Inconel 718 seals from steam at high temperatures. The undercoat is diffused into the surface of the parent metal by baking prior to

silver plating.

B67-10098

TOROIDAL RING PREVENTS GAS IGNITION AT
VENT STACK OUTLET
SPRING, T. R. /N. AM. AVIATION/ APR. 1967
M-FS-2042

Toroidal ring welded to the vent stack outlet prevents static discharges which ignite combustible gases in a venting system. The ring inhibits the flow of current by removing the cause of turbulence characteristics of a sharply defined vent exit.

B67-10105

TOOL FACILITATES INSTALLATION OF MARMON
CLAMPS
PETERS, G. A. WARMING, K. /N. AM. AVIATION/ MAY 1967
M-FS-2039

Adjustable tool facilitates the installation of Marmon clamps. It provides sufficient mechanical advantage to force the clamps into place, permitting one man operation. Two handles provide the major leverage, and a pivoting arm with a slot enables snap-out action.

B67-10107

COMPOSITE WELD ROD CORRECTS INDIVIDUAL
FILLER WEAKNESSES
GRIMALDO, S. /N. AM. AVIATION/ MAY 1967
M-FS-1923

Composite filler wire welds together an assembly made from components of Rene 41 nickel base alloy. Using equal parts of Rene 41 and Hastelloy W weld wire in the filler reduces the cracking and weaknesses of the individual parent metals.

B67-10117

INVESTIGATION OF PRESSURIZED TOROIDAL SHELLS
INNOVATOR NOT GIVEN /MARTIN CO./ MAY 1967 SEE
ALSO NASA-CR-261
HQ-27

The effect of internal pressure and external load on thin-walled toroidal shells was investigated. The result of the analysis agreed with experimental results on a 54-inch-diameter toroidal shell subjected to both pressurization and axial loading.

B67-10123

LOCK-DISCONNECT MECHANISM GIVES POSITIVE
RELEASE TO JOINED BODIES
BEAVER, C. E. /BOEING CO./ MAY 1967
M-FS-2147

Umbilical system mechanism locks and unlocks through an internal collet device that is controlled by a single reciprocating shaft. The reduction in the number of operational parts results in higher reliability.

B67-10154

ASPIRATOR INCREASES RELIEF VALVE POPPET
STROKE
BIDDLE, M. E. /N. AM. AVIATION/ MAY 1967
HQ-77

Addition of an aspirator to a relief valve increases the valve poppet stroke under dynamic flow conditions. The aspirator allows poppet inlet dynamic forces to overcome relief valve spring force. It reduces the fluid pressure in the skirt cavity by providing a low pressure sense probe.

B67-10158

SINGLE WRENCH SEPARATES NUTS FROM FREE-
FLOATING BOLTS
THOMPSON, C. /WESTINGHOUSE ASTRONUCL. LAB./ MAY 1967
NUC-10013

Pneumatic impact wrench removes the nuts from freely turning bolts when the heads cannot be reached or the shafts anchored. It uses a fixed screwdriver blade that fits a slot cut into the threaded end of the bolt shaft.

B67-10167

HYDROSTATIC FORCE USED TO HANDLE OUTSIZED,

HEAVY OBJECTS

CRAFT, G. W. STARKEY, A. W. /BELLCOMM. INC./
JUN. 1967
HQ-90

Specially fitted barge is used to load and transport large, heavy objects to a dock side site. There the barge itself can lift, rotate, and position the objects. Typical functions are economically accomplished by water buoyancy.

B67-10174

SCANNING MEANS FOR CASSEGRAINIAN ANTENNA
GIANDOMENICO, A. RUSCH, W. V. T. JUN. 1967
JPL-946

Mechanical antenna beam switching device detects weak signals over atmospheric and equipment noise sources in microwave antennas. It periodically nutates the paraboloidal subdish in a Cassegrainian reflector system.

B67-10177

EFFECT OF WELDING POSITION ON POROSITY
FORMATION IN ALUMINUM ALLOY WELDS
HARYUNG, J. WROTH, R. S. /DOUGLAS AIRCRAFT/
JUN. 1967
M-FS-2318

Program investigates the effects of varied welding positions on weld qualities. Progressive changes in bead geometry occur as the weld plane angle is varied from upslope to downslope. The gravitational effect on the weld puddle varies greatly with welding position.

B67-10178

FIXTURE FACILITATES HELIUM LEAK TESTING OF
PIPE WELDS
RONEY, J. A. /HAYES INTERN. CORP./ JUN. 1967
M-FS-2167

Fixture facilitates inspection testing of circumferential pipe welds for vacuum tightness, using helium gas as a leakage tracer in conjunction with a mass spectrometer. It consists of a split rubber torus and a mating clamping ring with a vacuum hose fitting.

B67-10180

WORK PLATFORM IS SUPPORTED BY SELF-LOCKING
BLADES
RUDDEROW, T. /N. AM. AVIATION/ JUN. 1967
M-FS-2297

Work platform has a supporting plate to engage the deck edge of the supporting structure when lowered into place. The plate is attached to blades hinged to the platform, rigidly supporting the platform when latched, and allowing the platform to be moved away when unlatched.

B67-10183

CONTINUOUS INTERNAL CHANNELS FORMED IN
ALUMINUM FUSION WELDS
GAULT, J. SABO, W. /N. AM. AVIATION/ JUN. 1967
M-FS-2399

Process produces continuous internal channel systems on a repeatable basis in 2014-T6 aluminum. Standard machining forms the initial channel, which is filled with tungsten carbide powder. TIG machine fusion welding completes formation of the channel. Chem-mill techniques enlarge it to the desired size.

B67-10195

WELD PROCEDURE PRODUCES QUALITY WELDS FOR
THICK SECTIONS OF HASTELLOY-X
FLENS, F. J. FLETCHER, C. W. GLASIER, L. F., JR.
/AEROJET GEN./ JUN. 1967
NUC-10048

Welding program produces premium quality, multipass welds in heavy tube sections of Hastelloy-X. It develops semiautomatic tungsten/inert gas procedures, weld wire procurement specifications, material weld properties, welder-operator training, and nondestructive testing inspection techniques and procedures.

B67-10198

GLASS BEAD SHOT PEENING RETARDS STRESS
CORROSION FAILURE OF TITANIUM TANKS
BALES, T. T. LISAGOR, W. B. MANNING, C. R.

SEYFFORT, M. B. JUN. 1967
LANGLEY-319

Rigidly controlled shot peening retards the incompatibility between titanium alloys and nitrogen tetroxide in rocket-propellant storage tanks. This sets up a residual compressive stress in the surface of a material which reduces tensile stresses in the material fibers, alleviating stress corrosion.

B67-10200

WORKMANSHIP STANDARDS FOR FUSION WELDING
PHILLIPS, M. D. /AEROJET GEN./ JUN. 1967
NUC-10050

Workmanship standards manual defines practices, that adhere to rigid codes and specifications, for fusion welding of component piping, assemblies, and systems. With written and pictorial presentations, it is part of the operating procedure for fusion welding.

B67-10202

APPARATUS FOR FABRICATION OF AMERICIUM-
BERYLLIUM NEUTRON SOURCES PREVENTS CAPSULE
CONTAMINATION
MOHR, W. C. VAN LOOM, J. A. JUN. 1967
ARG-184

Modified gloved enclosure is used to fill a capsule with a mixture of americium and beryllium radioactive powders to seal weld the opening, and to test it for leaks. It contains a horizontal partition, vortex mixer, mounting press, welder, test vessel, and radiation shielding to prevent surface contamination.

B67-10210

ENVIRONMENTAL STUDY OF MINIATURE SLIP RINGS
RADNIK, J. L. /IIT RES. INST./ JUN. 1967
M-FS-2443

Investigation studied the long term operation of miniature slip ring assemblies in high vacuum of space and included the influence of ring, brush, and insulator materials on electrical noise and mechanical wear. Results show that soft metal vapor plating and niobium diselenide miniature slip rings are beneficial.

B67-10211

HIGH-STRENGTH BRAZE JOINTS BETWEEN COPPER
AND STEEL
KUHN, R. F. /N. AM. AVIATION/ JUN. 1967
M-FS-2519

High-strength braze joints between copper and steel are produced by plating the facing surface of the copper with a layer of gold. This reduces porosity in the braze area and strengthens the resultant joint.

B67-10212

DESIGN CONCEPT TO DECREASE RELATIVE SPEED
OF BALL BEARINGS
JESMAN, S. /N. AM. AVIATION/ MAY 1967
M-FS-2003

Intermediate ring decreases the rolling speed of a ball bearing relative to the rotational speed of the shaft. It has raceways on its inner and outer peripheries and an additional row of balls. The modification permits operation at much higher shaft speeds than usual.

B67-10214

SYSTEM ENABLES DIMENSIONAL INSPECTION OF
VERY LARGE STRUCTURES
SIMPSON, R. R. /BOEING CO./ JUN. 1967
M-FS-2477

Precision rotary table with an integrated optical tooling bar system enables accurate and rapid measurement of linear and angular dimensions on very large structures of any configuration. The structure is mounted on the turntable, which can be rotated to expose any desired surface.

06 COMPUTER PROGRAMS

B67-10169
STUDY OF DYNAMIC RESPONSE OF ELASTIC SPACE
STATIONS
KAMRATH, P. /N. AM. AVIATION/ JUN. 1967
NPO-10124

Analytical procedure and the requisite computer programs compute the dynamic responses of two large elastic space stations. The linearized equations of motion are derived from Lagrange's equations. Then the normal modes of free vibration of the nonrotating space station are used to define the elastic degrees of freedom.

B67-10172
SPACE TRAJECTORIES PROGRAM FOR IBM 7090
HOLDRIDGE, D. B. JUN. 1967 SEE ALSO 32-223
NPO-10125

Space Trajectories Program studies the motion of a space probe confined to the solar system and influenced by the nonspherical Earth and Moon, and the point masses defined by the Sun, Venus, Mars, and Jupiter. It is written in the Fortran Assembly Program language.

B67-10173
LINEAR CIRCUIT ANALYSIS PROGRAM FOR IBM
1620 MONITOR II, 1311/1443 DATA PROCESSING
SYSTEM /CIRCS/
HATFIELD, J. JUN. 1967
NPO-10131

CIRCS is modification of IBSNAP Circuit Analysis Program, for use on smaller systems. This data processing system retains the basic dc, transient analysis, and Fortran II formats. It can be used on the IBM 1620/1311 Monitor I Mod 5 system, and solves a linear network containing 15 nodes and 45 branches.

B67-10193
COMPUTER PROGRAM SIMULATES PHYSICAL SYSTEMS
BY SOLVING THE SIMULTANEOUS DIFFERENTIAL
EQUATIONS DESCRIBING THE SYSTEMS
MANKOVITZ, R. J. JUN. 1967
NPO-10019

DIANA, a digital-analog simulation program for IBM 1620 II computer, simulates physical systems by solving the simultaneous differential equations describing the systems. It expands and optimizes the input-output capabilities, permits additional flexibility in midstream program alternation, and minimizes the computational time.

B67-10217
A MODAL COMBINATION COMPUTER PROGRAM FOR
DYNAMIC ANALYSIS OF STRUCTURES
BAMFORD, R. M. JUN. 1967
NPO-10129

Computer program determines the response of a composite linear structure to sinusoidal base motion of a restrained structure or sinusoidal forces of a free structure. This program is applied to problems of testing practices and closed-loop stability of autopilot controlled space vehicles. It is written for the IBM 7094 in Fortran IV language.

SUBJECT INDEX

Index to Tech Briefs

Subject Index

The title of each Tech Brief is listed under several selected subject headings to provide the user with a variety of approaches in his search for specific information. The Tech Brief number, e.g., B67-10148, is located under and to the right of the title and is followed by a two-digit number, e.g., 05, which designates the subject category in which the entire entry can be found.

A

ABLATING MATERIAL

New class of thermosetting plastics has improved strength, thermal and chemical stability
LEWIS-10108 B67-10197 03

ABRASIVE

Cracks in glass electrical connector headers removed by dry blasting with fine abrasive
LEWIS-381 B67-10148 03

ABSORPTION SPECTRUM

Status of ultrachemical analysis for semiconductors
M-FS-2254 B67-10138 03

ACCELEROMETER

Instrument sequentially samples ac signals from several accelerometers
JPL-884 B67-10029 01

Fixture tests bellows reliability through repetitive pressure/temperature cycling
MSC-1176 B67-10111 01

ACOUSTIC GENERATOR

System enables more complete calibrations of dynamic-pressure transducers
M-FS-2063 B67-10099 01

ADHESIVE

Resistance heating releases structural adhesive
M-FS-1607 B67-10045 05

Nonwoven glass fiber mat reinforces polyurethane adhesive
M-FS-2309 B67-10113 03

ALGORITHM

Computer program calculates monotonic maximum likelihood estimates using method of reversals
M-FS-1516 B67-10136 01

ALIGNMENT

Visual attitude orientation and alignment system
MSC-647 B67-10120 02

ALLOY

Recommended values of the thermophysical properties of eight alloys, their major constituents and oxides
NU-0095 B67-10062 03

ALPHA RADIATION

Alpha particle backscattering measurements used for chemical analysis of surfaces
ARG-116 B67-10186 03

ALUMINUM

Continuous internal channels formed in aluminum fusion welds
M-FS-2399 B67-10183 05

ALUMINUM ALLOY

Tests show that aluminum welds are improved by bead removal
M-FS-1817 B67-10023 05

Materials data handbooks prepared for aluminum alloys 2014, 2219, and 5456, and stainless steel alloy 301
M-FS-1959 B67-10089 03

Heat treatment study of aluminum casting alloy M45
M-FS-2397 B67-10159 03

Effect of welding position on porosity formation in aluminum alloy welds
M-FS-2318 B67-10177 05

AMERICIUM

Apparatus for fabrication of americium-beryllium neutron sources prevents capsule contamination
ARG-184 B67-10202 05

AMPLIFIER

Electrometer amplifier operates over dynamic range of five orders of magnitude
ARC-75 B67-10199 01

APERTURE

A conceptual, parallel operating data compression processor
NPO-10068 B67-10204 01

ARC HEATING

Laboratory arc furnace features interchangeable hearths
ARG-125 B67-10052 05

AROMATIC COMPOUND

Isostatic compression process converts polyaromatics into structural material
JPL-892 B67-10168 03

ATTENUATOR

Electrometer amplifier operates over dynamic range of five orders of magnitude
ARC-75 B67-10199 01

ATTITUDE INDICATOR

Visual attitude orientation and alignment system
MSC-647 B67-10120 02

AUDIO EQUIPMENT

Personal communication system combines high performance with miniaturization
MSC-720 B67-10119 01

AUTOMATIC DATA PROCESSING SYSTEM

Data retrieval system provides unlimited hardware design information
MSC-1144 B67-10170 01

Structural Analysis and Matrix Interpretive System /SAMIS/
NPO-10130 B67-10171 01

Linear circuit analysis program for IBM 1620 Monitor II, 1311/1443 data processing system /CIRCS/
NPO-10131 B67-10173 06

AXIAL LOAD

Investigation of pressurized toroidal shells
HQ-27 B67-10117 05

B

BACKSCATTER

Alpha particle backscattering measurements used for chemical analysis of surfaces
ARG-116 B67-10186 03

BALL BEARING

Design concept to decrease relative speed of ball bearings
M-FS-2003 B67-10212 05

BEARING

Composites of porous metal and solid lubricants increase bearing life
LEWIS-307 B67-10007 03

Tester for study of rolling element bearings
LEWIS-305 B67-10009 01

BELLAWS

Fixture tests bellows reliability through repetitive pressure/temperature cycling
MSC-1176 B67-10111 01

BENDING

Technique cuts time and cost of bending jacketed piping
WSO-333 B67-10018 05

BERYLLIUM

Apparatus for fabrication of americium-beryllium neutron sources prevents capsule contamination
ARG-184 B67-10202 05

Porous mandrels provide uniform deformation in hydrostatic powder metallurgy
M-FS-1972 B67-10209 03

BERYLLIUM FLUORIDE

Beryllium fluoride film protects beryllium against corrosion
LEWIS-363 B67-10026 03

BIOMECHANICS

Integrated mobility measurement and notation system
MSC-726 B67-10114 04

BIPROPELLANT

Addition of solid oxidizer increases liquid fuel specific impulse
JPL-861 B67-10058 03

BISTABLE AMPLIFIER

Experimental scaling study of fluid amplifier elements
M-FS-1882 B67-10088 02

BLADE

Work platform is supported by self-locking blades
M-FS-2297 B67-10180 05

BLINDNESS

Translator program converts computer printout into Braille language
M-FS-2061 B67-10087 01

BOLT

Single wrench separates nuts from free-floating bolts
NUC-10013 B67-10158 05

BONDING

Composite weld rod corrects individual filler weaknesses
M-FS-1923 B67-10107 05

BORON CARBIDE

Radial furnace shows promise for growing straight boron carbide whiskers
HQ-50 B67-10070 03

BOUNDARY LAYER CONTROL

Experimental scaling study of fluid amplifier elements
M-FS-1882 B67-10088 02

BRAZING

Ultrasonics permits brazing complex stainless steel assembly without flux
NU-0115 B67-10094 05

High-strength braze joints between copper and steel
M-FS-2519 B67-10211 05

BUOYANCY

Hydrostatic force used to handle outsized, heavy objects
HQ-90 B67-10167 05

C

CADMIUM

Abraded cadmium-plated cable connectors repaired by conversion coating
M-FS-1424 B67-10014 03

CALCIUM COMPOUND

Hydrated multivalent cations are new class of molten salt mixtures
ARG-211 B67-10033 03

CALIBRATION

Method accurately measures mean particle diameters of monodisperse polystyrene latexes
ARG-207 B67-10054 02

System enables more complete calibrations of dynamic-pressure transducers
M-FS-2063 B67-10099 01

CALORIMETER

Sensing disks for slug-type calorimeters have higher temperature stability
M-FS-1867 B67-10161 01

Fast-acting calorimeter measures heat output of plasma gun accelerator
LEWIS-388 B67-10192 01

CAPACITOR

Miniature capacitor functions as pressure sensor
JPL-903 B67-10020 01

Integrator can easily be set and reset with an electronic switch
ARC-10002 B67-10135 01

CAPSULE

Apparatus for fabrication of americium-beryllium neutron sources prevents capsule contamination
ARG-184 B67-10202 05

CARRIER FREQUENCY

Double emitter suppressed carrier modulator uses commercially available components
M-FS-2494 B67-10101 01

FM carrier deviation measured by differential probability method
M-FS-2166 B67-10213 01

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CASSEGRAIN ANTENNA					
Scanning means for Cassegrainian antenna				Electrometer amplifier operates over	
JPL-946	B67-10174	05		dynamic range of five orders of magnitude	
				ARC-75	B67-10199 01
CASTING				CLAMP	
Laboratory arc furnace features				Micromanipulation tool is easily adapted to	
interchangeable hearths				many uses	
ARG-125	B67-10052	05		JPL-129	B67-10004 05
Heat treatment study of aluminum casting				Tool facilitates installation of Marmon	
alloy M45				clamps	
M-FS-2397	B67-10159	03		M-FS-2039	B67-10105 05
CATHODE RAY TUBE				Clamp provides efficient connection for	
Electronic filter discriminates between				high-density currents	
true and false reflections				M-FS-2417	B67-10140 01
HQ-55	B67-10071	02		CLEAN ROOM	
CESIUM 137				Cleanroom air sampler counts, categorizes,	
Separation technique provides rapid				and records particle data	
quantitative determination of cesium-137				M-FS-2221	B67-10076 01
in irradiated nuclear fuel				CLEANING	
NUC-10047	B67-10194	03		Degreasing of titanium to minimize stress	
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Continuous internal channels formed in				LEWIS-382	B67-10147 03
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M-FS-2399	B67-10183	05		Closed circuit TV system monitors welding	
CHEMICAL ANALYSIS				operations	
Thermoelectric metal comparator determines				MSC-11002	B67-10162 01
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ARG-235	B67-10035	01		Self-sealing closure enables access to	
Ion exchange determines iodine-131				several fluid containers	
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ARG-208	B67-10129	04		COATING	
Status of ultrachemical analysis for				Abraded cadmium-plated cable connectors	
semiconductors				repaired by conversion coating	
M-FS-2254	B67-10138	03		M-FS-1424	B67-10014 03
Alpha particle backscattering measurements				Dispersion of borax in plastic is excellent	
used for chemical analysis of surfaces				fire-retardant heat insulator	
ARG-116	B67-10186	03		ARG-5	B67-10016 03
CHEMICAL MILLING				COMBUSTION	
Continuous internal channels formed in				Toroidal ring prevents gas ignition at	
aluminum fusion welds				vent stack outlet	
M-FS-2399	B67-10183	05		M-FS-2042	B67-10098 05
CHLORATE				COMMUNICATION SYSTEM	
Improved chlorate candle provides				Monitor assures availability and quality of	
concentrated oxygen source				communication channels	
MSC-1137	B67-10095	03		KSC-66-38	B67-10028 01
CHROMIUM				Personal communication system combines high	
Coating protects magnesium-lithium alloys				performance with miniaturization	
against corrosion				MSC-720	B67-10119 01
M-FS-2446	B67-10149	03		COMPARATOR	
CIRCUIT				Thermoelectric metal comparator determines	
Multipurpose instrumentation cable provides				composition of alloys and metals	
integral thermocouple circuit				ARG-235	B67-10035 01
NU-0108	B67-10046	01		Electronic frequency discriminator	
Solid-state time-to-pulse-height converter				M-FS-2434	B67-10151 01
developed				COMPENSATOR	
ARG-170	B67-10053	01		Modified univibrator compensates for output	
Circuit multiplies pulse width modulation,				timing errors	
exhibits linear transfer function				ARG-85	B67-10130 01
HQ-56	B67-10055	01		COMPOSITE MATERIAL	
Control circuit ensures solar cell				Composite weld rod corrects individual	
operation at maximum power				filler weaknesses	
GSFC-432	B67-10061	01		M-FS-1923	B67-10107 05
Modified univibrator compensates for output				COMPRESSION	
timing errors				Isostatic compression process converts	
ARG-85	B67-10130	01		polyaromatics into structural material	
Electronic frequency discriminator				JPL-892	B67-10168 03
M-FS-2434	B67-10151	01		COMPUTER	
Subminiature deflection circuit operates				Triple Modular Redundancy /TMR/ computer	
integrated sweep circuits in TV camera				operation improved	
MSC-1263	B67-10155	01		MSC-831	B67-10085 01

COMPUTER METHOD

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COMPUTER METHOD

Computer/PERT technique monitors actual
versus allocated costs
LEWIS-260 B67-10025 01

COMPUTER PROGRAM

Program computes single-point failures in
critical system designs
MSC-603 B67-10001 01

Computer program detects transient
malfunctions in switching circuits
MSC-604 B67-10002 01

Computer program simulates design, test,
and analysis phases of sensitivity
experiments
M-FS-1496 B67-10077 01

Translator program converts computer
printout into Braille language
M-FS-2061 B67-10087 01

Polynomial manipulator AP-168
MSC-1231 B67-10103 01

Computer program reduces calculation time
of normal response functions
M-FS-1517 B67-10108 01

Computer program calculates monotonic
maximum likelihood estimates using method
of reversals
M-FS-1516 B67-10136 01

A power-spectral-density computer program
NPO-10126 B67-10160 01

Study of dynamic response of elastic space
stations
NPO-10124 B67-10169 06

Space trajectories program for IBM 7090
NPO-10125 B67-10172 06

Linear circuit analysis program for IBM
1620 Monitor II, 1311/1443 data processing
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NPO-10131 B67-10173 06

Computer program simulates physical systems
by solving the simultaneous differential
equations describing the systems
NPO-10019 B67-10193 06

A modal combination computer program for
dynamic analysis of structures
NPO-10129 B67-10217 06

COMPUTER PROGRAMMING

Self-starting procedure simplifies numerical
integration
ARC-50 B67-10013 01

Structural Analysis and Matrix
Interpretive System /SAMIS/
NPO-10130 B67-10171 01

COMPUTER SIMULATION

Computer program simulates physical systems
by solving the simultaneous differential
equations describing the systems
NPO-10019 B67-10193 06

CONDENSATION

Crystal microbalance measures condensable
molecular fluxes
JPL-845 B67-10012 03

CONDUCTIVITY METER

Electronic circuitry used to automate paper
chromatography
JPL-840 B67-10201 01

CONNECTOR

Abraded cadmium-plated cable connectors
repaired by conversion coating
M-FS-1424 B67-10014 03

Orbital tube flaring system produces tubing
connectors with zero leakage
M-FS-2016 B67-10019 05

Feed-through connector couples RF power into
vacuum chamber
NU-0096 B67-10027 01

Edge-type connectors evaluated by
electrical noise measurement
M-FS-2243 B67-10125 01

Clamp provides efficient connection for
high-density currents
M-FS-2417 B67-10140 01

CONTAMINANT

Quartz crystals detect gas contaminants
during vacuum chamber evacuation
NPO-10144 B67-10205 01

CONTAMINATION

Apparatus for fabrication of americium-
beryllium neutron sources prevents capsule
contamination
ARG-184 B67-10202 05

CONTROL DEVICE

Elastic guides reduce hysteresis effect in
Belleville spring package
JPL-910 B67-10011 05

Variable-pulse switching circuit accurately
controls solenoid-valve actuations
M-FS-1895 B67-10022 01

Improved fluid control circuit operates on
low power input
LEWIS-325 B67-10042 01

Heater control circuit provides both fast
and proportional control
M-FS-906 B67-10097 01

Multiplexing control device enables handling
of wide variations in sampling rates
M-FS-1871 B67-10150 01

CONTROL SYSTEM

Rigid-body motion extracted from total
motion of a flexible body
ARC-63 B67-10081 05

CONVERTER

Solid-state time-to-pulse-height converter
developed
ARG-170 B67-10053 01

COOLANT

Coldplate of pin fin design makes efficient
heat exchanger
MSC-1093 B67-10073 05

COPPER

Neutron activation analysis traces copper
artifacts to geographical point of origin
ARG-119 B67-10036 02

Correlation established between heat transfer
and ultrasonic transmission properties of
copper braze bonds
ARG-247 B67-10037 02

Porous mandrels provide uniform
deformation in hydrostatic powder
metallurgy
M-FS-1972 B67-10209 03

High-strength braze joints between copper
and steel
M-FS-2519 B67-10211 05

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LEWIS-363 B67-10026 03

Variable reluctance switch avoids contact
corrosion and contact bounce

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M-FS-2446	B67-10149	03	NPO-10068	B67-10204	01
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Zirconium alloys with small amounts of iron and copper or nickel show improved corrosion resistance in superheated steam			Numerical data frame readout system used in testing telemetry systems		
ARG-226	B67-10050	03	GSFC-551	B67-10175	01
Study made of corrosion resistance of stainless steel and nickel alloys in nuclear reactor superheaters			DATA RECORDER		
ARG-230	B67-10051	03	Run numbering system for use with data recorders		
Controlled ferrite content improves weldability of corrosion-resistant steel			M-FS-2557	B67-10215	01
M-FS-568	B67-10069	03	DEFLECTION		
Study to minimize hydrogen embrittlement of ultrahigh-strength steels			Subminiature deflection circuit operates integrated sweep circuits in TV camera		
M-FS-2455	B67-10141	03	MSC-1263	B67-10155	01
Iron serves as diffusion barrier in thermally regenerative galvanic cell			DENSITOMETER		
ARG-29	B67-10189	03	Liquid hydrogen densitometer utilizes open-ended microwave cavity		
COUNTER			LEWIS-390	B67-10115	01
Strain gage circuitry provides fatigue testing machine with accurate cycle count			DENSITY MEASUREMENT		
NU-0114	B67-10093	01	Instrument continuously measures density of flowing fluids		
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LEWIS-381	B67-10148	03	Complex surfaces plated by thin-film deposition in one operation		
CROSS CORRELATION			LEWIS-292	B67-10006	05
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M-FS-1268	B67-10030	01	Portable detector set discloses helium leak rates		
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JPL-731	B67-10128	02	GSFC-540	B67-10072	02
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ARG-96	B67-10134	02	FM carrier deviation measured by differential probability method		
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CRYOGENIC TEMPERATURE			ARC-50	B67-10013	01
Cryogenic fatigue data developed for Inconel 718			Computer program simulates physical systems by solving the simultaneous differential equations describing the systems		
M-FS-702	B67-10049	03	NPO-10019	B67-10193	06
CRYOSTAT			DIFFUSION		
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CRYSTALLOGRAPHY			DIFFUSION BONDING		
Neutron diffractometer allows both magnetic and crystallographic analyses			Silver plating ensures reliable diffusion bonding of dissimilar metals		
ARG-191	B67-10131	02	M-FS-1975	B67-10124	03
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Alpha particle backscattering measurements used for chemical analysis of surfaces			Iron serves as diffusion barrier in thermally regenerative galvanic cell		
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DATA COMPRESSOR			Numerical data frame readout system used in testing telemetry systems		
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DATA PROCESSING			Digital computer processing of X-ray photos		
Digital computer processing of X-ray photos			JPL-792	B67-10005	04
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			M-FS-520	B67-10181	01
			Computer program simulates physical systems by solving the simultaneous differential		

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NPO-10019 B67-10193 06

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Lock-disconnect mechanism gives positive release to joined bodies
M-FS-2147 B67-10123 05

DISCONTINUITY
Calibrating ultrasonic test equipment for checking thin metal strip stock
NUC-10009 B67-10127 01

DISPLACEMENT
Cryogenic seal remains leaktight during thermal displacement
ARG-96 B67-10134 02

DISPLAY SYSTEM
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GSFC-551 B67-10175 01

DRIFT
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GSFC-572 B67-10102 03

DYNAMIC RESPONSE
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NPO-10124 B67-10169 06

DYNODE
Electron multiplier has improved performance and stability
GSFC-546 B67-10060 01

E

ECHO
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ELASTOMER
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NPO-10123 B67-10207 04

ELECTRIC CONDUCTIVITY
Hydrated multivalent cations are new class of molten salt mixtures
ARG-211 B67-10033 03

Static electricity of polymers reduced by treatment with iodine
NPO-10062 B67-10132 03

ELECTRIC CONNECTOR
Cracks in glass electrical connector headers removed by dry blasting with fine abrasive
LEWIS-381 B67-10148 03

ELECTRIC CONTACT
Variable reluctance switch avoids contact corrosion and contact bounce
MSC-1178 B67-10137 01

Thin film process forms effective electrical contacts on semiconductor crystals
M-FS-2343 B67-10142 01

ELECTRIC CURRENT
Clamp provides efficient connection for high-density currents
M-FS-2417 B67-10140 01

ELECTRIC MEASUREMENT
Edge-type connectors evaluated by electrical noise measurement
M-FS-2243 B67-10125 01

ELECTROHYDRAULIC FORMING
High-energy-rate magnetohydraulic metal forming system
M-FS-2142 B67-10126 02

ELECTROLUMINESCENCE
Plotter design simplifies determination of image sensor transfer characteristic
NPO-10164 B67-10206 01

ELECTROLYTE
New electrolyte may increase life of polarographic oxygen sensors
MSC-1049 B67-10003 03

ELECTROMAGNET
Neutron diffractometer allows both magnetic and crystallographic analyses
ARG-191 B67-10131 02

ELECTROMAGNETIC INSTRUMENT
High transients suppressed in electromagnetic devices
KSC-66-13 B67-10031 01

Improved fluid control circuit operates on low power input
LEWIS-325 B67-10042 01

ELECTROMECHANICAL DEVICE
Residual magnetism holds solenoid armature in desired position
LEWIS-343 B67-10038 01

Instrument continuously measures density of flowing fluids
LEWIS-309 B67-10080 01

ELECTROMETER
Electrometer amplifier operates over dynamic range of five orders of magnitude
ARC-75 B67-10199 01

ELECTROMOTIVE FORCE
Thermoelectric metal comparator determines composition of alloys and metals
ARG-235 B67-10035 01

ELECTRON BEAM WELDING
Electron beam welder X-rays its own welds
LEWIS-10111 B67-10216 02

ELECTRON MULTIPLIER
Electron multiplier has improved performance and stability
GSFC-546 B67-10060 01

ELECTRONIC EQUIPMENT
Coldplate of pin fin design makes efficient heat exchanger
MSC-1093 B67-10073 05

ELECTRONIC FILTER
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HQ-55 B67-10071 02

ELECTRONIC RECORDING INSTRUMENT
Technique for strip chart recorder time notation
GSFC-473 B67-10196 01

ELECTRONIC SWITCH
Integrator can easily be set and reset with an electronic switch
ARC-10002 B67-10135 01

Hybrid solid state switch replaces motor-driven power switch
JPL-931 B67-10165 01

ELECTROPLATING
Silver plating ensures reliable diffusion bonding of dissimilar metals
M-FS-1975 B67-10124 03

ELECTROSTATIC CHARGING
Test instrumentation evaluates electrostatic hazards in fluid system
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M-FS-1517 B67-10108 01

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M-FS-1516 B67-10136 01

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NPO-10124 B67-10169 06

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differential probability method
M-FS-2166 B67-10213 01

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MSC-1240 B67-10156 01

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M-FS-1975 B67-10124 03

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RANDOM VIBRATION

A power-spectral-density computer program
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M-FS-2277	B67-10145	01				
M-FS-2297	B67-10180	05				
M-FS-2309	B67-10113	03				
M-FS-2318	B67-10177	05				
M-FS-2343	B67-10142	01				
M-FS-2394	B67-10144	01				
M-FS-2397	B67-10159	03				
M-FS-2399	B67-10183	05				
M-FS-2417	B67-10140	01				
M-FS-2434	B67-10151	01				
M-FS-2437	B67-10146	01				
M-FS-2443	B67-10210	05				
M-FS-2446	B67-10149	03				
M-FS-2448	B67-10143	01				
M-FS-2455	B67-10141	03				
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M-FS-2478	B67-10122	03				
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M-FS-2519	B67-10211	05				
M-FS-2557	B67-10215	01				
MSC-228	B67-10164	02				
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MSC-647	B67-10120	02				
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MSC-722	B67-10119	01				
MSC-726	B67-10114	04				
MSC-831	B67-10085	01				
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MSC-1231	B67-10103	01				
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NPO-10062	B67-10132	03				
NPO-10068	B67-10204	01				
NPO-10123	B67-10207	04				
NPO-10124	B67-10169	06				

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